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THE DYNAMICS OF PERSONALITY*

C. EUGENE RIGGS, M.D.
Professor Emeritus, Nervous and Mental Diseases, University of Minnesota
St. Paul

The most dramatic sentence, perhaps in all medical literature, was that uttered by Virchow, the great German pathologist — "Everything from a cell." Previous to this it had been supposed that the body functioned as a whole—whatever that meant. It had never dawned upon the minds of medical men that the body was a commonwealth of countless millions of cells—vital units bound together in a harmoniously working whole. The old physiologist, Flourens, taught that the brain functioned as a whole, little realizing the wonderful discoveries later to be made by Ferrier, Horsley and their confrères, that it possessed specialized centers with specialized functions, which worked together in such perfect unity and harmony as if they were a single cell.

Some have estimated that in the human organism there are 26,500,000,000 cells; that in the central nervous system there are three thousand million cells and that in the brain cortex, which is one-ninth of an inch in thickness, there are twelve hundred million cells. In this great commonwealth of cells are to be found those whose function is very simple, and between these and the most complex and highly specialized—the last evolved—the nerve cell, there is every possible degree of difference. The old physiologies used to teach that body tissue changed every seven years. We know enough about physical activities and chemical reactions to know that this change takes place with much greater rapidity. How much greater is not definitely known. Without doubt the tissue that goes to make up our brain cells has been replaced very frequently during our lifetime. The marvelous thing is that the impressions that were made many years ago, notwithstanding this constant change in the cell structure, are distinct and as clear-cut as those made more recently. This is a perpetual miracle.

In this human organism—this commonwealth of cells—there are 200 bones, 230 joints, 260 pairs of muscles. In the biceps muscle, there are 600,000 fibers; three hundred muscles are involved in the act of walking. The body is 75 per cent water. The red blood cells are small discs which give to the blood its color; they are the oxygen carriers and the coloring matter is due to their hemoglobin content; this contains the iron. Each molecule† of hemoglobin contains something like 2,000 atoms of iron. The iron of the blood is in very small quantities and can be truly called a precious metal. There are about fourteen pints of blood in the human body. If one exercises energetically, this passes through the heart and completes a circuit of the body in ten seconds. It is estimated that the heart of a person seventy years of age has pumped blood into his arteries 2,500,000,000 times. There are certain cells in the organism which possess specific functions. They may be called the genii or wonder-workers of the body. These specialized cells, with their specific activities, are known as the ductless glands because they discharge their chemical messengers or hormones directly into the blood. In its stream they travel along until they reach the points where their activities manifest themselves, and it is due to their work that the body-building is completed and its various functions are initiated, established and perfected. Certain of the hormones of these glands have been discovered. Dr. Charles Mayo told me that a ton of thyroids was required before the active principle of this gland was discovered. It is also said that after this hormone was made synthetically Dr. Kendall forgot the formula and that he spent eighteen months in further investigations before he rediscovered it. Insulin, the hormone of the pancreas, is one of the greatest discoveries of the past twenty-five years. In the near future, the hormones of the remaining glands will undoubtedly be found and the physi-

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†The Outline of Science, Thomson, vol. 2, p. 330.

cian of the future, knowing as he then will the part they play in the human organism, will be able, by supplying the deficient hormones, to eliminate many diseases and will undoubtedly greatly prolong human life. Death will then be a euthenasia.

These 26,500,000,000 cells constitute a machine the like of which never has been constructed by human hands. It is a self-building, a self-stoking, a self-repairing, a self-regulating machine. It is a remarkable and unique automatic mechanism surpassing anything of the kind in the universe (Thompson). It manifests certain marvelous phenomena such as thought, reason, judgment, volition, will, hope, love—which no chemical reactions or physical activities can explain. Waterston, a distinguished physicist of the last century, states that no bodily reaction can explain human or organic conduct.

Personality is the sum of the activities of this commonwealth of cells. The dynamics of personality are this aggregation of cells, the elemental instincts and acquired experiences—the mental and spiritual flowering of the organism. Personality is the product of these multitudinous influences of their currents and counter-currents. "The least attractive personality is more unfathomable than the whole material universe. Matter itself is a great mystery, but when it embodies mind and mind functions through matter, there springs into being the masterpiece of creation." Tradition, the home, the school, the church, the social order, play their part in its evolution. It is a continuous development—broadening—widening—enriching as the years go by. "It is the net resultant of all our yesterdays."

"Build Thee more stately mansions, oh my soul,
As the swift seasons roll;
Lift Thy low vaulted past;
Let each new temple nobler than the last,
Shut Thee from Heaven with a dome more vast,
Till Thou at length art free,
Leaving Thine outgrown shell by life's unresting sea!"

The evolution of the nervous system most vital for this study occurs during childhood, pubescence and adolescence. At the seventh year, the brain has approximately attained its weight—the most rapid growth being between the first and fourth years. Of the three thousand million cells in the central nervous system, it is in those of the brain itself that our interest particularly centers. The newborn child is an automaton. The nerve centers necessary to life predominate in function. Following life's ageless patterns, the dendrites and axis cylinders grope their way along their predestined paths until the eighteenth year, when the marvelous artistry of the nervous mechanism is achieved. Of these countless millions of brain cells each has found its anatomic relationship and infinite complexity has become amazing simplicity—functioning as a single unit.

"Trailing clouds of glory do we come
From God who is our home."

If heredity, trauma or infection does not mar, a perfected machine is the end-result. An instance of this is seen in Laura Bridgman, the blind, deaf mute, in whom in these specialized localities normal development ceased at the end of the second year (Donaldson). Having anatomically arrived, during the second seven years of life, the brain, physiologically speaking, has to find itself; nerve courses have to be charted, nerve currents have to find their appointed channels in order that normal functioning may be established. Clearly, pubescence and adolescence play a major part at this period of development when nature's supreme effort is to achieve anatomically and physiologically a finished mechanism. This is personality's testing time. For this crucial moment, heredity waits, and through life's web and woof its shuttle finds the way. "Every man," says Oliver Wendell Holmes, "is an omnibus in which all his ancestors are seated."

Many hereditarians manifest an evangelistic zeal, a faulty logic, a crude reasoning and an unjustified dogmatism not in accord with the scientific spirit. Of this the notorious Kalikak family is an instance. Martin Kalikak conferred a despicable immortality on a feeble-minded young girl. Since morons possess the instincts of an adult and the self-control of a child, why not other Martin Kalikaks? Therefore, the paternity of the offspring of this girl cannot be positively established. She was a *nameless*, feeble-minded girl. Diagnosis cannot be based on tradition and hearsay. "Breeding the human being," says Myerson, "is still an unknown science and nowhere in life does it run so true to form as depicted in the history of the Kalikaks."

In his book, "Social Control of the Feebleminded," Stanley P. Davies says, "We can be certain of

only one thing at present with regard to the mode of transmission of hereditary mental defects, and that is of our uncertainty. In other words, the existing state of knowledge on the subject permits of reaching no final conclusions. It merely indicates the importance of much further study and investigation. At the same time it is clear that the apparently final conclusions expressed some years back are no longer tenable."

Read that remarkable little book, "Prometheus or Biology and the Advancement of Man," by Professor Herbert Spencer Jennings of Johns Hopkins University. It scraps the term "inheritance." Professor Jennings' conclusion is that so long as biparental reproduction remains—

"Capitalists will continue to produce artists, poets, socialists and laborers; laboring men will give birth to capitalists, to philosophers, to men of science; fools will produce wise men and wise men will produce fools; who mounts will fall, who falls will mount; and all the kinds of problems presented to society by the turns of the invisible wheel will remain."

Why always stress the Kalikaks, the Jukes and the like; why not emphasize Jonathan Edwards and his 1,394 descendants—not a criminal or feebleminded person among them. Cecil, in England, is an honored name. Robert Cecil was Governing Minister in the sixteenth century. In the nineteenth century, a Robert Cecil occupied the same honorable position. For two generations the Pitt family was perhaps the most distinguished in the political history of England. Undying words were those of the elder Pitt, "If I were an American as I am an Englishman, while a foreign troop was landed in my country, I would never lay down my arms —never, never, never." These are notable instances of a normal heredity and show that germ plasm may indefinitely preserve its virility.

"There are only two diseases, genetically speaking, namely, color blindness and hemophilia," says Stockard, "that are inherited and possess clear-cut mendelian characters."

As far as human matings go, the mendelian theory has not been sufficiently tested. The late Dr. Omerod and Sir Bryan Donkin have pointed out that there are too many complicating factors to permit mendelian principles, which are so striking in animals where breeding can be controlled, to be applied in relation to mental diseases (Mott). Its acceptance with our present knowledge is unscientific and leads to false and absurd conclusions. It is entirely probable that there are many inheritable diseases in which there is transmission of the germ plasm from one generation to another (Stockard), but this remains to be genetically proved. The too general assumption that heredity plays an inevitable part is a fatalistic doctrine that discourages investigation and ends progress. If, on the other hand, we say "that environment in some of its forms, as toxin, infection and lowering of vitality acts in a blastophoric way we are stirred to research and study" (Myerson). "We talk about the 'ids' and the 'genes' so glibly and so heatedly at times," says Barker, "that an occasional dash of cold water from the rigid experimentalist can scarcely fail to be salutary." The same writer states that "one must distinguish between inheritance of disease and the inheritance of tendency. The germ plasm represents a disposition to disease. The actual disease is the result of a reaction between what was in germ plasm and its environment; hereditary disease is probably dependent to an extent for its manifestations upon the environment of the developing organism." Environment is a definite force to be reckoned with; Weisman and Mendel are mountain peak men, but their views have been greatly overstressed. Hysteria, neurasthenia and psychasthenia are clinical syndromes, not diseases—are varied expressions of personality in varying stages of dissociation, due to trauma, infections and emotional strain. So-called neuropathic and psychopathic tendencies are probably blastophoric abnormalities not transmissible for more than one generation; they are evidences of a constitutional vulnerability—as determining influences in maladjustment they have been greatly overexaggerated. Searching for them as evidence of heredity is as futile as following the will-o'-the-wisp. Insanity is a meaningless term—mental disease is the proper appellation. "It is very necessary to recognize," says Mott, "that the germ cells of every person who is certified as insane and sent to a mental hospital are not necessarily potential transmitters of a mental disease." "It has been reliably estimated that of the 7,000 infants born each day in the United States, about 270 or one in twenty-six eventually become incapacitated by abnormalities of the mind" (Strecker and Ebaugh).

In psychiatry, there are two defects which can probably be called unitary—that can be transmitted from generation to generation. These are de-

mentia præcox and the manic-depressive psychoses. The other forms of mental symptoms in disease are basically somatic, as observed in a great variety of bodily affections. Paresis, although characterized by a great variety of mental symptoms, is not a mental disease. The mental phase appears in the course of a luetic infection. To use the precise words of Dr. Hugo Richter, it is a spirochetosis of the cerebral cortex. Epilepsy can no longer be regarded as hereditary; it also is a syndrome, not a disease. Essential epilepsy is not a disruptive cortical discharge, as we used to believe—a concept endeared by the years; this theory is no longer tenable. Tumor, syphilis, cerebral arteriosclerosis, trauma, toxic states are well known factors. In essential epilepsy we are dealing with definite but unknown factors. Researches in decerebration have taught us that it is a dropping out of the cerebrum from activity and the unleashing of lower motor centers—probably the mid-brain (Myerson).

Certain forms of feeble-mindedness seem to possess a unitary character and are probably germ plasm defects, but the proportion of such families to the mass of the feeble-minded is comparatively small. Environmental and prenatal influences, infections and trauma are the predetermining causes, the effects of which are probably not handed down. My contention is that as medical men we know too little about heredity to formulate theories or determine therapy. To being foreordained and predetermined as is now so popular, I object. *Heredity tells us the source of our talents but it does not leave us helpless in the grip of ancestral tendency.*

Pubescence is an epochal moment. Hitherto, the normal child has shown no definitely differentiated masculine or feminine characteristics aside from those arising from environmental conditions. Life, thus far, has been as carefree as a holiday. Each moment a feeling of joy, no anxieties to mar, no serious responsibilities to depress. The relation between the boy and the girl has been one of good fellowship—a pleasant camaraderie. Then a subtle, insidious, startling change—the hormones have begun their predestined task—male and female traits become definite and apparent. Something intangible separates them; this they dimly perceive, but fail to understand. The boy is conscious of a feeling to please, to appear to the best advantage; pimples humiliate him; slovenliness he avoids. He is crudely chivalrous, mildly patronizing. This is the particular time in the life of the male, when the inferiority complex feebly and precariously functions. The girl, no longer audacious, becomes diffident and retiring. To the tomboy the strenuous life no longer appeals—a new shyness, gentleness and thoughtfulness enhance personality with a compelling graciousness; idealism, hopefulness and a capacity for self-sacrifice are outstanding traits. To youth has come an enthralling vision; its soul quivers with vague yearning and inarticulate desires. Dimly it perceives that it is a link in Nature's chain of infinite purpose; it is the custodian of a deathless heritage—the germ cell.

Our mental faculties develop in a gradually orderly manner. The capacity to reason is not attained before the twelfth year (Goddard). Imagination does not come into its own until the fourteenth year. It is during the evolution of the mental powers that the brain is flooded with countless impressions through the senses. Home, school, church and social order pour into it an overwhelming tide of ideas, new, strange and of infinite variety. The amazing thing is that the mind out of this chaos can bring forth cosmos.

As we study the developmental process, the one dominating thought is that life is a continuous conflict, "a biological and spiritual venture," for youth and adult alike; both travel the same road; one's journey ends a little sooner than the other. The vital unit in this great adventure is the home. Too frequently it is not realized that each member of the family has a different rhythm; youth is the period of rapidly changing moods. Living together is an art. The girl or boy should be treated with kindliness, not harshness; handicaps of mind and body need great consideration; impulses and instinctive tendencies should be carefully guided; the ethical and social nature should be developed. Bad behavior and anti-social conduct frequently seen in youth arise from various causes, notably, mental conflict, the sex instinct, changes in the ductless glands and the inferiority complex. Jealousy, hypocrisy and antagonism between parents may give rise to mental retardation and delinquency. It has been demonstrated that when an emotional conflict has been relieved in a child the intelligence quotient may run up thirty or forty points in three months (Mrs. Wooley). The average child, with reasonable care, will develop a normal personality. Childhood has four outstanding characteristics—suggestibility, plasticity, imi-

tativeness and love of approbation. Because of these fundamentals, Thom established a habit-clinic for children in the pre-school age. By virtue of their plasticity, their personalities can be moulded and remoulded and healthy habits ingrained. Suggestibility and imitativeness possess the magic qualities of a fairy's wand. Disregarding the 15 to 20 per cent of abnormals—feeble-minded, epileptic, neurotic and those manifesting endocrinic disturbances—which surveys of school children have shown to exist, parents hold their child's future absolutely in their hands. In childhood, "the pattern of human reaction is formed." Dr. Barnard Glueck regards behavior as a dynamic process—a series of events following a certain series of causes—that the early years are the most determining, the most important years of life and that the greatest potential influence in the development process is human environment—particularly that of the home. The family today is and ever has been in flux; constantly it is readjusting itself to the ever-varying human needs.

The maladjustments that mar life usually occur in the development period; those not arising from disease are due largely to fault in the home—to parental neglect. Because the home failed in this evolutionary crisis, the state had to intervene and "assume duties which the parents were unable or unwilling to fulfill"; to meet a grave crisis the juvenile court was established. The attitude of the court toward the delinquent is that of a wise parent toward an erring child. * * * "Too many people," says President Coolidge, "are neglecting the real well-being of their children, shifting the responsibility for their actions and turning over supervision of their discipline and conduct to the juvenile courts. A very large proportion of the outcasts and criminals come from the ranks of those who lost the advantages of normal parental control in their youth. They are the refugees from broken homes, who were denied the necessary benefits of parental love and direction. What the youth of the country needs is not more public control, through Government action, but more home control through parental action." Judge Nott of the Court of General Sessions, New York City, in a recent Scribner's Magazine, says, "No word nowadays is really more abhorrent to the American people than the word 'discipline.' They hate to subject their children to it,—they hate to submit to it themselves or inflict it upon lawbreakers. * * * They seem to regard 'discipline' and 'cruelty' as synonymous words."

Civilizations rise and fall every 1,000 or 2,000 years. American civilization is traveling the same road. The same causes of decay are in evidence today—neglect of the child, greed for wealth, power, luxury, unwillingness to work and serve, living for pleasure and the gratification of sense. In my youth, delinquency was practically unknown. Incorrigibles there were, but of such rarity as to create for themselves an unenviable notoriety. The automobile, the movies, the home—two rooms and a kitchenette—are all disintegrating factors, but greater far is the lack of interest on the part of the father and an irritable, unsympathetic and pleasure-mad mother. "Home," says an American Juvenal, "is a place where if you have to go they will take you in." Self-determination, so false and detrimental to the best interest of the child, disrupts the healthy home life. Nothing could be more absurd than that a boy or a girl passing through the crucible of evolution, subject to the sweep of elemental forces, inexperienced, judgment immature, self-control unstable, should be expected or permitted, unadvised, to pilot their ship on what is to them an uncharted sea. The earliest and basic feature of this dry rot in the American home is failure to appreciate ethical and spiritual values—biological necessities. Without these elemental verities no home can exist. Morality is imperative; immorality idiocy. The failure of parents to find the child's level, incapable therefore to understand his problem, is greatly to be deprecated. This viewpoint of vision, only parental love can attain. The behavior of the child in the home reminds one of the pain and muscle spasm in appendicitis—a mechanism of defense.

There have been two destructive forces the last few years that have been a peril to the developing child and a menace to the home. I was taking a walk recently when a little treble voice commanded me, at the point of a toy pistol, to put up my hands and be snappy about it, an example of the educational character of the present-day movie. Children are pre-eminently suggestible and they have no inner censor to enable them to distinguish between the false and the real. What can society expect of children whose convictions and ideals are movie-born? Freudian philosophy has poisoned our morals, placed false emphasis on sex, undermined the home and dethroned God—a dying cult, but

a devastating force. Thus, Nature reaches her goal —the attainment of adolescence, in the commonwealth of cells that constitute the human organism; we have seen the gradual unfolding of personality, and in its evolution we have beheld the travail of a human soul.

The middle years bring their definite and distinctive stress. Involution is the second great epoch in the making of personality. The life impulse gradually wanes and the forces of disintegration begin their predetermined task. Hereditary tendencies, ofttimes quiescent in the developmental period, now awaken into activity. The manic-depressive psychosis and the dementia precox syndrome are an ever-present menace. Involution is a normal physiological process—it is the reaction of personality to definite biological and environmental conditions that constitutes the peril of the middle years; it is Nature's readjustment period of the organism. Changes in the ductless glands tend to nervous instability; overeating and lack of exercise open Pandora's box and the degenerative diseases which cause an alarming mortality spring forth. The middle years are also a testing time of personality. The restraints of the childhood home, the influence of parents long since dead, brothers and sisters scattered, constitute a waning force. Not only may physical efficiency be impaired but in addition to this organic stress there is great perturbation in the psychic sphere due to unhappy marriages, disappointment in children, the loss of the ideals and aspirations of the early years and embitterment because hopes and ambitions have fallen so far below actual accomplishments. The outstanding dynamic at this time is the home, children and friends—a sustaining and stabilizing power. The serpent in this paradise is a neglect to cultivate and be responsive to the imperative ought. Into the subconscious, the wayward wish gains entrance, which purposeful phantasy kindles into flame until the growing complex dominates all control; integrity, probity and a stainless past are often lost in the current of resistless desire. The delinquencies of "the riotous forties" arise not from caprice or lawless impulse, but are due to the harboring of the antisocial thought in the subconscious whose activities determine the issues of life—a glorious consummation or an ignoble defeat.

Old age is the final epoch in the life cycle. It is inevitable; one can honor and dignify it, but cannot escape it. Many are born old; some old are young; one has said, "At forty, old age is in its infancy; the fifties are its boyhood and girlhood; the sixties its youth; and at seventy it attains its majority." The Greek language possesses great flexibility of expression. "Bios" means both life and death—a subtle suggestion that we achieve life through death. When one reaches the sixtieth year, he can be called old; the senium has been reached. At about forty-five years in man and fifty in woman the brain begins to lose weight slowly, and at eighty or past, it has lost four ounces (Dana). Even in the normal senium, where degenerative change has not become pathologic, to be swept aside willy nilly causes a tinge of bitterness—a feeling of injustice that strength and virility should so lack in appreciation and graciousness. "It is only those rarely serene souls," says Myerson, "who reach an elevated resignation." The rarely serene souls, I believe to be the rule rather than the exception. To youth, age is afar off; the joy of life enthralls. Ofttimes it is critical, even harsh —age has had its day; as for death it is an event too remote to interest. Age realizes the inevitable; it revels in the glories that are past; like Allan Seeger, it keeps its rendezvous with death undismayed. Age is life's crown of glory; the past has made possible this culmination of Nature's foreordained purpose. It is man's last opportunity—so have the great souls regarded it. Said Clara Barton to a gathering of friends in her ninetieth year, "My working hours are fourteen out of the twenty-four. It is my duty to work for the good of my kind; while the strength is given me I have no right to lay it down." Conrad wrote his first novel when he was fifty years of age. Gladstone took up Greek in his sixtieth year and was made Premier of England in his eighty-third year. Charles the Fifth summoned Titian to Augsburg to court, to paint portraits when he was seventy years old and he was still painting them when over ninety, dying in his ninety-ninth year. Michelangelo was made architect of St. Peter's in his seventy-second year; he then planned the great dome immortalizing himself and his art. Marion Harland at eighty-eight broke her wrist; unable afterwards to use her pen, she learned typewriting; later, becoming blind, she dictated her articles. She died in her ninety-third year. Of her it is said, "The ardor for study and expression never burned low in her heart." Four years ago, James Bryce

made his masterly address at the Williamstown Conference; he was in his eighty-fourth year. William D. de Morgan was sixty-five years of age when he wrote his first novel. It is said the girls who typed the manuscript were moved to tears and laughter as they did their mechanical work. He died at eighty-seven while working on one of his most interesting stories. Julia Ward Howe, endeared to the American people because of her beautiful poem, "The Battle Hymn of the Republic," wrote the reminiscences of her life when eighty years of age. The founder of the Red Cross, Clara Barton, gave an address in her eighty-ninth year, before six hundred people, standing during its delivery, and after its close, greeted graciously her audience. She died in her ninety-first year, mentality unimpaired. Joshua, the ancient hero, was already old and stricken in years when he received his Lord's message, "There remaineth yet very much land to be possessed." With splendid courage and efficiency he completed the divine commission. The master of modern medicine, Sir William Osler, contracted in October, 1919, a cold, which gave him, as he described it, "a bad knockout." In one of his last letters he wrote, "The confounding thing drags on in an unpleasant way and in one's seventy-first year the harbour is not far off —and such a happy voyage and such dear companions all the way! — and the future does not worry."

Age has its desires, its aims, its ambitions; it is selfless, sagacious, disillusioned. With magnificent courage, it says with Browning:

> "Grow old along with me,
> The best is yet to be,
> The last of life for which the first was made."

STARCH DIGESTANTS

Recent studies of salivary digestion show that 76 per cent of the starch of mashed potatoes and 59 per cent of the starch of bread was converted to maltose, an additional percentage being changed to dextrin. If food is properly masticated and starch digestion allowed to proceed fifteen minutes or so in the stomach, almost as much starch is broken down as when digestion can proceed for a long time. For this the high amylase content of saliva is responsible. The use of amylase preparations in medicine has lost its former vogue. With starch presented in readily digested form, there is little need for salivary digestants—that is, the responsibility for proper digestion of starch is being transferred to the technic of the food factory and the kitchen instead of the purveyor of digestive ferments. (Jour. A. M. A., April 24, 1926, p. 1288.)

A NEW ORIENTATION OF THE PSYCHO-NEUROSES*

CHARLES R. BALL, M.D.
St. Paul

If variety of opinion may be regarded as a sign of progress we are warranted in feeling that progress has been made in our understanding of the multiform phenomena exhibited in the type of cases enrolled under the category of the psycho-neuroses. The conflict of ideas in this field of scientific endeavor may be compared with the confusion of tongues at the Tower of Babel.

The prevalent lay opinion was well expressed by the husband of a nervous patient of mine. In speaking of his wife he used quite glibly the term "hysterical" in a way which aroused our curiosity. After listening to his use of this expression several times we finally asked him to tell us just what he meant by the expression. For a second he seemed embarrassed, became red in the face, made some ineffectual efforts to explain without emitting any sounds, and then said in this way, "Why, hysterical is when a woman wants something and throws a few fits to get it." This lay definition, however far from the truth it may be, has at least the merit of not being ambiguous, and also of recognizing the psychic origin of the condition.

In the medical world our conceptions of hysteria have often not had even this much to recommend them. Among medical men, Charcot was one of the first to direct his studies to hysterical phenomena. Although he assumed a physical basis for hysteria, namely, a change in the neuro-muscular tonus, he laid great weight on the fact that psychic symptoms might be of equal importance with the sensory and motor in the physical sphere. He also emphasized the close relationship of both these series of symptoms, and especially this relationship when it applies to the exciting causes.

The conception of neurotic and hysterical manifestations as due to exhaustion—a fatigue of the nervous mechanisms—has been the predominating one since the days of Charcot and with such authorities as Janet, Beard, Rockwell, and Weir Mitchell, as well as many others. Janet says, "The starting point of hysteria is the same as that of the great neuroses; it is a depression and exhaustion of the

*Read before the Ramsey County Medical Society, St. Paul, September, 1925.

higher functions of the encephalon." He explains himself further by saying, "All the psychological functions do not present the same difficulty." There are some operations that are easy, first, because they are simple and only require the union of a small number of elements; second, because they are so old—that is, the nervous mechanisms have been conditioned by generations of ancestors to react to these stimuli. Reactions which require so little effort that they take place unconsciously we go through with in an automatic manner. Such reactions are chiefly concerned with the ordinary routine of our daily life. On the other hand, there are functions much more difficult and complex which necessitate, as White says, "the systematization of an infinite number of elements, and above all require a present synthesis." As an illustration of these two types of reaction—we may meet a neighbor, no matter how tired we may be, and go through with the ordinary formalities of a casual greeting in a perfectly satisfactory manner, but if we have to discuss with him some important matter of a complicated nature we shrink from the contact because we realize at that particular time our own inadequacy. The psychic effort required is too great for our nervous fatigue to endure.

This theory of nervous fatigue at first thought seems attractive, and the illustration just given makes apparently quite a satisfactory explanation. It calls up situations which we all find ourselves in repeatedly, and is true as far as it goes, but when one comes to apply it critically as the great underlying causes of psycho-pathology, as we understand this subject now, it becomes woefully inadequate. The illustration just used is that of a perfectly normal reaction and occurs in all of us as the difference in the normal reaction between a state of rest and that of fatigue. It does not account in any degree, for example, for the reactions of a so-called psychopathic individual whose conditioned reactions are paranoid in character as well as also so contracted in consciousness that he is absolutely unable to make contact with reality. Such an individual meets his neighbor with the conditioned state of a prejudice beforehand that the neighbor is seeking to harm him, and all his reactions during the contact between them are the direct result of this delusional condition. The very existence of paranoid delusion without any basis of reality must also presuppose some defective mental capacity. Therefore, something entirely different in character must be found other than fatigue to explain the multifarious psychopathic phenomena which we observe in our nervous and mental patients.

It is just here while we were still clinging to our ideas of fatigue that Freud appears on the scene. White, in his book, "The Foundations of Psychiatry," says, "To begin with perhaps the most important single thing stressed by Freud and his followers has been their deterministic attitude towards psychological facts." No matter what the idea or feeling, it must have an adequate explanation in psychological terms. That is to say, when a patient comes to you complaining about a fear of being alone, which is so intense and persistent that it amounts to an obsession, there is a reason for that fear. Freud says that if a sufficient analysis is made of that patient's life perhaps away back in about their third or fourth year it may be discovered that this patient's parents were in the habit of tucking the patient snugly in his little crib, locking up the house, and either going to the movies or out in their Ford for a joyride. A very attractive reason, but not entirely satisfying. Such a simple explanation of which our patient knew nothing until his past had been unfolded before him by the means of a painstaking examination could scarcely convince us as the reason for the existence of this phobia. We still feel that the old saying, "What we do not know we do not bother about," holds good here as in other things. Granted, however, that we are willing to accept this episode as a cause for this obsession, suppose then we ask ourselves why this phobia only came on this patient at this time. It was twenty-five years ago since his parents owned a Ford. Why did this fear conditioned then, all prepared for delivery, so to speak, lie dormant all the intervening years to arise up before this patient as a terrifying spectre to haunt him at the present time? A logical answer to this question would seem impossible. We are willing to accept without question Freud's application of the old truism of a cause for everything to psychological facts. There is surely a reason for this fear obsession of our patient's, but the reason stated above, or some similar one, does not appeal to us as the real one.

Jelliffe, who perhaps may be called a good Freudian, in discussing in his book, "The Elements of Psycho-Analysis," the relationship of the conscious to the unconscious, says, "The unconscious is to the conscious as a million years is to the present moment," which is only another way of saying that

what the individual himself acquires in conditioned reactions as his very own is exceedingly insignificant to that furnished him, first, by man since the time of Adam, which may be spoken of as phylogenetic in origin, and, second, by his ascendants, which is designated as onto-genetic. If we dig in hard enough in our examination into the family history of this patient with such an obsession we may discover the very interesting fact that the patient's mother and his grandmother before him had a similar fear. The fear in such a case is not an acquired reaction, as the psycho-analyst would make it, depending on some terrifying experience long forgotten, in the life of the patient, buried deep in his unconscious past, but an inherited emotion, a family pattern which, although falling in the psychic sphere, is of much deeper significance than a mere life's episode because it depends upon nervous mechanisms conditioned to this peculiar reaction by long generations of ancestors.

Some time ago we had the opportunity of hearing Professor McDougal of Harvard discuss the Oedipus complex, which has been aptly called the Ark of the Covenant in the Freudian doctrine. You know the Freudians are very fanciful in their choice of phraseology, and in seeking characters to express their thought the period of mythology has been selected as a favorite one with them. It is to this Freudian inclination that Oedipus deserves his present rather undesirable fame. Freud has contributed much to our understanding of complicated nervous phenomena, but almost too much, we feel inclined to say, at least in some directions. The Freudian interpretation of the Greek drama of Oedipus would seem to make Oedipus a sexually abnormal son. The story itself implies no such meaning. The oracle foretells at Oedipus' birth that he is to kill his father and marry his mother. In order to escape such a terrible fate he is left by his parents as an infant on a barren mountain to die. There he is found by a shepherd and taken care of. When he grows up and hears what the oracle has foretold about him he himself tries to forestall the horribly prophecy by leaving his country. The story tells us that in the end what the oracle has foretold about him comes to pass. In an accidental meeting on the highway he encounters his father without having the slightest idea who he is, and in a quarrel he kills him. Afterwards he marries his mother without knowing who she is. When the mother finds out what she has done in her shame she gouges her eyes out, and Oedipus leaves the country feeling forever disgraced. The whole intention of the story appears to be to show how impossible it is to escape the wrath of the gods—to get away from what fate has intended for us. In order to make the truth which he wishes to teach as clear as possible, Sophocles, the author, endeavors to create as impossible and repulsive a situation as he is able to imagine, then give all those concerned in it a warning of the dreadful thing which is to befall them so that they may have every opportunity of avoiding it if such a thing is possible. We see nothing in this story of Oedipus to suggest to any one the sexual import which Freud has given it in his interpretation of the Oedipus complex. This complex is, in short, that for the male infant the mother is the first sexual fixation and for the female the father. This complex is regarded as universal and present during our entire lives. Of course the sexual fixation changes as we go along in life, and in female patients is supposed to involve even the doctor, and on the doctor's involvement depends the whole theory of the doctrine of transference.

Professor McDougal's conclusion concerning the Oedipus complex was that no such feeling has an existence either in infancy or adolescence, in normal persons. We have only to search our own memories of infancy and childhood in an analysis of the love of our mother to agree unanimously with Professor McDougal. The most of us are far along in childhood before we know anything about such a distinction as that of sex. So far as the doctrine of transference is concerned—which is, that the fundamental relationship between the doctor and his patient is a sexual one—it is absurd. We do not see how a normal mind could consider it.

We owe much of value to Freud for the better understanding he has given us of the workings of the psychic mechanisms. We also feel that we have much to hold him responsible for in unloosing in the world such a reprehensible doctrine as the Oedipus complex and the pan-sexualism which he has developed from it. A pleasure-mad world has taken it up and is making use of it as a scientific and respectable explanation for justifying its immoralities.

The Adler theory of organ inferiority is also an attractive one. Adler in explaining what he means by inferior organ says, quoting from White's "The Foundations of Psychiatry" again, that the inferior

organ hangs on to its childlike infantile ways of developing pleasure, if by pleasure the fulfillment of desire in its broadest sense is meant. He uses as an illustration the skin "which in infancy is the avenue through which all sorts of comforting and organically delicious sensations are transmitted to the baby, and therefore in the adult may continue as a source of organic pleasure out of all proportion to the part it should play in a properly balanced picture of the functions of an adult considered in their totality." In Adler's concept of the psycho-neuroses the fundamental element is the feeling of inferiority, which feeling is based on an inferior organ, which, as the case may be, is skin, stomach, abdominal viscera, sexual apparatus, etc. The behavior, then, of the patient depends on an inferiority complex and the reactions of the psychic mechanism represent the methods of the patient for overcoming these feelings. For instance, patients find themselves inadequate to a certain situation. They fight even with themselves against admitting the inferiority complex into their consciousness, and the fight is fiercer when it comes to permitting their environment to realize this inferiority, so to end the conflict in some satisfactory way they establish a compromise. Their method of fixation depends somewhat upon their previous ways of avoiding obstacles. It may be by flight into sickness, such as shell shock, nervous breakdown, a sudden amnesia, or, in case of a railroad accident, what has been variously called railroad spine, traumatic neurosis, compensation neurosis, and latterly in Germany, and what is perhaps the best name of all, "Zwecks Neurosen"—design or purpose neurosis. We asked a shell-shocked soldier in France how long he went to school and found he stopped in the sixth grade simply because he did not want to go any longer. He was either unwilling to do the work, or unable to do what was necessary in order to keep up with his fellows. He would not stop school with this explanation of inferiority even to himself, so he told his parents that his eyes hurt him so much that he was unable to study. Again when at the front in France he would not acknowledge that he was unable to stand the strain which the rest of his comrades were enduring; his way out this time was shell shock—the same psychic mechanism playing over again the same rôle.

Jung, in his conception of the psycho-neuroses, creates what he calls the collective unconscious, an unconscious not only made up of the patient's past but also including family and race as well.

Careful study of these Theories of Freud, Adler, and Jung shows that fundamentally they do not differ so greatly, aside from Freud's conception of pan-sexualism. White, in discussing the chief distinction between the theories of Freud and Jung, says that the former is a drag back, while the latter is a push back, "which is just about the difference between a drag and a push, whatever that may be." It does not seem to us to be such a very great distinction whether the patient is dragged back into regression by the conditioned mechanisms of his unconscious, or is pushed back because of his inferiority to cope with present situations—a difference between tweedledum and tweedledee.

Even though we accept these concepts as the explanation of psycho-pathology, there still remain some questions which require more clarification. How many of the symptoms of the so-called nervous patient are under the control of the will, and how many are beyond his sphere entirely? What symptoms belong to the conscious and what to the unconscious, and how are they related?

The description of a patient now under observation will best illustrate these points. This patient has a depression; he has lost interest in his work, family, current events, etc.; he is unable to concentrate; he cannot eat; he cannot sleep; his mental anguish is great. When we inquire about the cause for this depression we find his mind is fixed on the fear of suicide. This thought has the force behind it of a compulsory idea or impulse. When we ask our patient why he wishes to commit suicide, we receive the rather astonishing answer that he does not, that he wishes to live. The thought of suicide tortures him because he is afraid he might, and so far as his own conscious desires go he wants to live just as much as any of us. In his family history we find that the patient's father did commit suicide. The knowledge of this may have had some influence in the way of suggestion in causing his fear. But on inquiring further it was ascertained that the suicidal impulse was not the only one with which this patient was affected. He has suffered with different kinds of compulsory impulses, among others a homicidal one towards his family. He was as much afraid of this impulse as of the suicidal one, and certainly did not wish to do his family any harm. His disposition

towards them otherwise was a perfectly normal one.

He had another very interesting symptom directly connected with these thoughts. Whenever they were present in his mind with the accompanying emotional disturbances of fear and depression he complained of a peculiar burning pain extending from his forehead down the side of his nose. It is perfectly clear to us that both of these symptoms —the compulsory impulses and the burning pain— were not in any way under the control of the patient's will. If he had his choice we think he would have preferred to carry rattlesnakes around in his pockets rather than these thoughts in his brain. In our opinion both of these symptoms were in no way conditioned by any of the patient's life experiences; they were conditioned in the nervous mechanisms of his family, doubtless through a series of generations, just as much so as his family features, form, etc., had been conditioned in the process of his family's evolution. The burning pain down the nose which always accompanied these thoughts is of itself interesting and instructive. We are not accustomed to associating physical phenomena with mental content. This is one reason perhaps why nervous symptoms have been so hard to understand. Yet very definite and positive objective symptoms often occur as a result of emotional complexes. Although these complexes are to greater or lesser degree under the control of the will, these objective symptoms are entirely beyond such control. Often indeed the patient is not conscious of them. An emotional disturbance may be so severe that the patient breaks out in a cold sweat, or faints, or vomits, or even has a severe diarrhea. We must all admit the objective character of such symptoms. We know also that emotional disturbances in those so disposed may cause a severe headache. Then why may we not explain many of the neuralgic pains and various paresthesias, freezings, and burnings, such as our nervous patients complain of, on the same basis? If we will recognize emotional complexes as causes of the various sensory phenomena of which our patients complain we will help our understanding of functional nervous conditions very much.

Another extremely interesting thing in relation to the periodical attacks, or nervous breakdowns, so-called, of this class of patients is the similarity of one attack to another. If we compare the present attack with former ones we find they all resemble each other quite closely. Very often a case of manic-depressive insanity may recognize some time in advance the approach of another attack by the similarity of the sensations to those which he experienced in his former attacks. We all know about the so-called aura or warning of the epileptic. It is practically always the same and the epileptic recognizes it and prepares accordingly. The interest here is that we see the same mechanisms reacting in the same way again and again.

In an experimental study of O. Lowenstein, concerning simulation and its relationship to hysteria, some very interesting facts were observed. The author selected thirty-two apparently normal persons and suggested to them in various ways that they simulate sickness. In the thirty-two cases there were four who in spite of the fact that subjective symptoms were complained of by them seemed unable to express their subjective sensations in any physical manner. All the others, to be sure in different degrees, were found to have physical symptoms. To most of those seeking to pretend illness a tremor of some sort was their choice of expression. Other favorite means of expressing their simulation of sickness were in the forms of anesthesias, hyperesthesias, paralyses, etc. It is worth while to note here that these symptoms are the ones most commonly found in our personal injury cases and those of similar type where method in their madness may be reasonably suspected. As the layman said, "They want something and throw a few fits to get it." These simulated symptoms were spoken of as the primary ones and were of course under the control of the will. As a result of the emotional state accompanying the simulation, and this is the most interesting and important observation in this study, certain other symptoms, which were designated as secondary, were noted which were not under the control of the will, and which in some instances the patients were not even conscious of—such symptoms as nystagmus, hyperidrosis, nausea and vomiting, acute diarrhea, reddening of the face, changes of temperature of the hands and feet, temporary absence of the light reaction of the pupils, loss of the superficial reflexes, etc. The author also observed in his experiments that the number and severity of the secondary symptoms varied with the degree of intensity with which his test patients entered into the spirit of their simulation. The most important observation from these studies was

the different character of the two classes of symptoms, the primary and secondary—the former entirely simulated, and the latter normal reactions produced by the test person's emotional state and varying with it, but not under the control of the will or even necessarily in the patient's consciousness. These secondary symptoms were considered by the author as the true hysterical or nervous phenomena.

What a flood of light these secondary reactions shed in a clearer understanding of nervous symptomatology in general. Our patients suffer with some emotional strain as a result of which certain reactions depending on the varying tonicity of their nervous mechanisms and their familial reaction patterns take place, such as the burning pain down the nose of the patient previously mentioned and a host of nervous phenomena which, because of their protean nature, could scarcely be enumerated. These phenomena are not under the control of the patient's will or even necessarily in the patient's consciousness.

It is a poor rule which will not work both ways. We have been speaking of symptoms, primary and secondary, and stressing especially the secondary as a result of emotional states. There is a very large class of nervous patients, perhaps the most numerous unfortunately, whose emotional states are entirely caused by the peculiar reactions of their psycho-physical mechanisms. The entire reason for their subjective nervousness lies in the fear and depression induced by their psycho-physical reactions. A description of Mrs. R. will serve as a good example of this large type of nervous cases. Patient is twenty-eight years old. The nervous symptoms of which she now complains began in November, 1924. She was undergoing a rather severe reaction from vaccination when she awakened one night out of a sound sleep and found herself numb all over. No matter where she touched herself she could not feel except on her face and neck. This condition lasted for a few minutes and then passed away completely but left her extremely nervous and apprehensive. However, the next day she tried to treat the matter as a joke. In about two weeks she had another spell apparently different in character, but when one considers it more carefully, quite similar. This time the patient was talking to her daughter when all at once she experienced great difficulty in getting her breath and both her daughter's person and voice were perceived by her as being far away. On close questioning patient says she as a girl had often fainted, especially at her menstrual period, without any apparent cause, and that last winter once while coming out of a skating rink she became dazed for a short time and had no idea for a few minutes where she was. These symptoms come under the category of epileptic phenomena. There is no history of an emotional complex, the attacks simply come and go "out of the blue," as the patient expressed it, perfectly autonomic and always quite similar in type—a normal reaction of an abnormally conditioned nervous mechanism.

As a result of these spells always coming to the patient suddenly and unexpectedly, presenting such startling phenomena to her, her life has become one of continual fear and dread. She is much depressed and does not care to live if she has to go on in this way. In this type of case, which is the type of many, unfortunately, the cart is before the horse, and emotional complexes, as it were, come after the event and are entirely secondary in nature. It is in such cases as these that the Freud-Jung-Adler theories appear inadequate. We turn with interest again to the teachings of Charcot and his ideas concerning neuro-muscular tonus, or neuro-vegetative tonus, and their hyper- and hypo-tonicities.

Since the teachings of Freud and his followers we have been so imbued with the idea of some sort of complex conditioned in our own lives as the cause of all nervous phenomena that some of the Freudians have even gone so far as to treat epilepsy by psychoanalysis.

We see then from the clinical viewpoint two great types of the neuro-psychoses, the one which may be said to be almost entirely endogenous or autonomic in character, and the other exogenous, depending for its reaction to a greater or lesser degree on environmental conditions. They are both for their reactions dependent on nervous mechanisms age old in their evolution and development, and in order to visualize these mechanisms properly we may think of them as reflex arcs just as truly as the reflex arc responsible for the knee or ankle jerk. The only difference is the knee jerk represents the reaction of a lower center and a simple arc, while nervous phenomena are the reactions of higher centers and more complicated arcs. The knee jerk is much increased in a patient during excitement. The same thing holds

good in the reflex arcs of the higher centers. The analogy might be continued indefinitely. Of course, in these two types one is scarcely ever found absolutely true to type. Characteristics of both types are found in each, but it is the predominating characteristic which determines the type under which the case is to be enrolled. We would scarcely enroll the epileptic under the exogenous or emotional complex type because we know epileptic attacks occur under the most favorable environment conditions. On the other hand, we can not deny that a multitude of things such as a dog fight or a piece of mince pie might precipitate an attack.

The golf player is remarkable in the number of alibis he is able to give to account for his hooks and slices. The nervous patients and their relatives are equally remarkable in the skill with which they are able to recall sunstrokes, falls out of high chairs, etc., to explain the reactions of inherited mechanisms. Consequently the history of the case, which should be such an important factor, is apt to be extremely misleading. A sister-in-law of a recent patient with melancholia said of this patient that she was never much interested in her home, that she was not satisfied with her husband's salary, that she always wanted something better in the way of clothes than she had, that she was lazy and fault-finding, etc. Here, then, was an inferiority complex made to order. The thing was easy. We would unroll the scroll of the patient's past life on a magical screen before her, show her how her present state was merely the natural result of an inferiority complex, and presto produce a complete revolution in her mental attitude. We carried out our part of the program. All the patient's shortcomings were carefully pointed out to her, to which she meekly agreed. Her depressed state of mind made her willing to admit everything we said and more, but her mental reaction remained unchanged. When we got all through she finally said, "I just don't think it's that way, Doctor. I felt good last winter, and this thing sort of dropped down on me suddenly like a 'bolt out of the blue'." Here again another case according to the Freud-Jung-Adler concepts caused by inferiority complexes, but in which they were actually as little responsible as they are in the epileptic attack.

There is one thing more which we regard as exceedingly important in the elaboration of this conception of the psycho-neuroses, which is well shown in the patient just mentioned. This is an understanding of the part which the unconscious plays —the real unconscious in the current sense in which we use this term as the opposite of the conscious. In a former attack, according to relatives, the patient reacted in much the same way as at present. She was depressed, constantly depreciated herself, was indifferent to her surroundings, took no interest in anything, and thought she was wicked and doomed. The attack completely passed over. The normal individual, the normal consciousness, would make contact with this reality, especially when it was pointed out to him, and this knowledge would help him to recognize the entire morbid mental content as due to illness. The normal consciousness would resolve the situation something like this: "I had these same thoughts before. After a while they passed away. The depression cleared up entirely. I saw when I became well that my ideas of personal unworthiness, my feeling that I was doomed, my desire to die, were all wrong. They were not due to wickedness as I thought then; they were due to sickness. I will not make the same mistake again. I will profit in my mental reaction by my former experience." Such patients are never able to make this normal contact with the reality of their former illness. In their present state they are entirely unconscious of the incidents of a former attack, just as much as if they never had it. This unconsciousness may be compared with that of the ostrich who sticks his head in the sand and then feels because he sees no one that nobody can see his great body and legs. Or to the little boy who covers his eyes with his hands and then thinks no one is able to see him. The consciousness in all these cases is disturbed, contracted, much like vision in hysterical blindness. In the hysterical blindness the vision is narrowed down so that the patient can only see what is directly in front of him. What is taking place at the sides he is unaware of and, still worse, he does not know he is unaware of it. If some one accidentally collides with him on the street he becomes indignant, feels perhaps he has been insulted, when, as a matter of fact, the accident was entirely due to a visual disturbance of which he is not conscious. This illustration of a normal reaction to an unconscious disturbance of vision makes in our opinion the explanation of the symptoms of what we have called the complex type of nervous patient —that is, the patient whose secondary or hysterical

reactions proper are caused by some emotional disturbance. There is first this contraction of consciousness, naturally an increase in the extent of the unconscious, and as a result the inability to make normal contact with reality. Let us carry the comparison between the patient with the hysterical contraction of vision and the same type of contraction of consciousness a little further. They both feel they are right, and from their point of view they are. There is only one difficulty with it, and that is they both start with a false assumption, the blind man that he sees well, the man with the contracted consciousness—the unconscious—that he thinks straight. Their reasoning and conduct are quite rational, granting their fears or delusions to be true. In all our neurotics and psychotics the fatal defect lies in the false premise. The same thing applies equally as well to the anti-social type. Their arguments may be sound, but the premises from which they begin are mere assumptions. As an illustration, recently we read in the paper the statement by a well-known "progressive" concerning evolution, "There are something like thirteen thousand scientists in this country who believe in evolution, but we must understand there are 110 million people who do not. Who shall prevail, the thirteen thousand or the 110 million?" Of course, there is no question who would prevail if the assumption were true that all the scientists were evolutionists, and all the 110 million other inhabitants were not. This is a very good example of the method of reasoning of this kind of patient, or individual, or, for that matter, with what may be called the ostrich type of consciousness. We have at present under observation a neurotic patient who some time in every twenty-four hours dies once or twice, and she has been dying in the same way for quite awhile. If she were able to make contact with reality, to be conscious of her former dying spells in her present ones, the absurdity of this death scene recurring over and over again would soon stop it. The only reason the performance continues is because thus far she is unable to make this normal contact.

Summary: We see in our studies two great causative factors in the psycho-neuroses. First, the emotional disturbance, or complex, which is always in varying degree under the control of the will. These symptoms, which are the direct result of the complex, have been called by Löwenstein in his "simulation" experiments the primary ones. Second, the symptoms which are in no way under the patient's control and either may or may not be an indirect reaction as the result of the complex. These are regarded by the same author as the true hysterical symptoms. It is in these symptoms, due sometimes to emotional tension, sometimes occurring spontaneously, that something seems suddenly to slip, to use a homely expression, like the belt on the pulley which runs the machinery. The machines slow down, almost may come to a stop, when just as suddenly perhaps the belt on the pulley tightens, the machines speed up, and the usual "factory hum" is again heard. We ourselves like to think of the vagus and sympathetic, the vegetative nervous system, as the belt. There is one great distinction to keep in mind between the complex and epileptic types, using the term epileptic in the sense of comparable reactions. In the complex the belt on the pulley was never exactly a fit. It has been slipping to a certain extent all the time, sometimes more, sometimes less. The consciousness of such patients is in a varying state of continual contraction. This is easily recognized in the confirmed neuropath, a psychopath, or even in the anti-social individual. Owing to their contraction of consciousness they never seem able to make normal contact with reality. In the epileptic type, however, the contraction of consciousness is apt to be more of a temporary nature. When the attack passes over, complete or nearly complete mental vision is restored. One thing more, in the management of all these cases, let us remember, it is not so much the hunter who causes the ostrich to stick its head into the sand. That particular reaction has long been a habit in the ostrich family.

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SPONTANEOUS MENINGEAL HEMORRHAGE: WITH REPORT OF SEVEN CASES*

ERNEST M. HAMMES, M.D.
Associate Professor of Nervous and Mental Diseases, Medical School, University of Minnesota
St. Paul

The main types of intracranial hemorrhage which one encounters can readily be classified into three groups. The one group is the ordinary cerebral apoplexy associated with hemorrhage into the substance of the brain, and accompanied by definite clinical evidences of gross cerebral pathology. The second group are the cases of extradural hemorrhage associated with head trauma and for mechanical reasons usually small and well defined. In the skull the dura, adherent to the bony case, prevents excessive bleeding, while in the spinal canal the peridural fat and connective tissue serve as a similar obstruction. In the third group we place the cases of meningeal hemorrhage due either to injury to the head or to non-traumatic factors. Those cases in which no trauma exists are spoken of as spontaneous meningeal or subarachnoid hemorrhage.

In the study of 124 cases collected from the literature Symonds[1] found that the known pathologic causes of this hemorrhage are those which lead to bleeding elsewhere in the body. In seventy-one cases a definite etiology was noted. Arteriosclerosis associated with cardiac or renal disease and of toxic or infective origin is the most frequent factor. Weakened arterial walls may rupture or lead to the formation of an aneurysm, with subsequent rupture. In the toxic-infective group are placed the acute bacterial infections of hemorrhagic type, chronic alcoholism and syphilis. Although syphilis is the most frequent cause of aneurysm in the general arterial system, it less often produces this result in the cerebral circulation. This is probably due to the fact that in syphilitic infection of the cerebral blood vessels there is a greater tendency to proliferation of the intima (Huebner's endarteritis) with thrombi formation than to degeneration of the media and adventitia, with a subsequent weakening and dilation of the blood vessel wall. Other causative factors are aneurysms due to local defects of the media, possibly of congenital origin, blood diseases, thrombosis of the superior longitudinal sinus, eclampsia, sunstroke, and degenerative tumors or cysts. In forty-one of the 124 cases no definite etiology was given. Various theories have been advanced to explain these cases. Symonds believes that a ruptured aneurysm is the causative factor in the majority of instances. This may be either on an arteriosclerotic foundation or due to a local congenital defect of the media. In the forty-one obscure cases the ages varied from ten to fifty-eight, with an average of thirty. This is too young for the usual arteriosclerotic changes. In eighteen of the cases no adequate cause could be found, even at postmortem. However, a ruptured aneurysm may have been present, undetected because of its small size or it may have been buried in the extensive blood extravasation.

Goldflam,[2] on the other hand, does not include cases of ruptured cerebral aneurysm in his group of spontaneous meningeal hemorrhage. He believes that those cases, with an unknown etiology in the young, are a true diapedesis. He suggests that the fundamental cause may be a functional disturbance of vasomotor control, and the bleeding of venous origin, analogous to that which is said to occur in migraine, Raynaud's disease, and erythromelalgia. An active hyperemia is produced by the irritation of the vasodilators and the paralysis of the vasoconstrictors. This inflammatory congestion occurring in blood vessels with impaired walls is the basis for the capillary oozing on the surface of the brain. Goldflam[3] reports thirteen cases but without sufficient detail or postmortem findings to substantiate his theory. A definite history of migraine was given in seven of his seventeen cases.

Pathologic studies by McKinley, Polczak, and Young* seem to support Goldflam's theory. In a personal communication received from them they state as follows:

"Diffuse hemorrhage into the subarachnoid space was the characteristic feature of the gross pathology of our cases. Microscopically we found meningeal, and occasionally cerebral, vessels, particularly of the venous circulation, surrounded by perivascular infiltrations of lymphocytes. The red cells in the hemorrhages were fairly well preserved for the most part. It seems evident to us that inflammatory degeneration of the vessel walls was the factor responsible for the hemorrhage in each of the cases."

*Retiring President's Address, Ramsey County Medical Society, January 25, 1926.

*Neuropathologic Laboratory, Medical School, University of Minnesota.

The symptoms of spontaneous meningeal hemorrhage depend upon the extent and location of the hemorrhage (either supra- or infratentorial). These manifest themselves in the main by evidences of meningeal irritation, by signs of increased intracranial pressure, and by an hemorrhagic spinal fluid. The occurrence of a monoplegia or hemiplegia or other paralytic phenomena is very rare and if present is usually of short duration. These symptoms are due to mechanical causes and produced by the pressure of the extravasated blood upon the surface of the brain. Their transient character is an important diagnostic point in differentiating from a cerebral hemorrhage, from hemorrhagic encephalitis or other destructive lesions involving the brain tissues themselves. If the hemorrhage is an extensive one, such as occurs with the rupture of an aneurysm or of one of the larger arteries, the patient is suddenly seized with a severe headache, becomes unconscious, passes into a state of coma, and dies within a few hours. The correct diagnosis can be suspected when, upon lumbar puncture, a uniformly hemorrhagic spinal fluid is found, but can only be verified by a careful postmortem examination. If the hemorrhage is not as extensive and more gradual, the patient usually complains of a severe headache, which may or may not be followed by a short period of unconsciousness. Soon after, irritative meningeal symptoms manifest themselves. The headache continues with great severity and is accompanied by nausea, vomiting, and mental confusion. There is marked neck rigidity, a positive Kernig, the patient may complain of photophobia, restlessness, and muscular twitchings. The reflexes may be normal or pathologic. There is usually a moderate fever. The spinal fluid is under pressure and uniformly hemorrhagic. If the bleeding continues, the intracranial and irritative phenomena become more pronounced until exitus occurs. If the bleeding subsides the symptoms disappear fairly rapidly and the patient may recover. However, there may be a recurrence in later years.

The hemorrhagic spinal fluid is perhaps the most important diagnostic sign. The spinal fluid is under increased pressure, contains an even admixture of blood in a series of specimens collected at the same puncture, does not form a coagulum, and the supernatant fluid obtained from centrifuging or standing is definitely brownish or yellowish in color. This pathologic fluid can be readily differentiated from the accidental contamination of blood at the time of lumbar puncture. In the latter case the fluid is definitely bloody at first and then gradually becomes clear, a clot forms on standing, and the supernatant fluid is colorless.

A hemorrhagic spinal fluid as a result of an intracranial lesion signifies that bleeding has occurred either into the subarachnoid space or into one of the ventricles. In spontaneous meningeal hemorrhage the blood almost invariably enters the subarachnoid space. In supratentorial lesions, where the visceral layer of the arachnoid is relatively closely applied and attached to the pia mater covering the cerebral convolutions, diffusion of the blood is slow. There is a tendency to clotting, and the surface of the brain is covered by a thin hemorrhagic layer. If the bleeding is rapid, localized cerebral pressure may occur because of these mechanical factors. In infratentorial lesions at the base of the brain, where the arachnoid is loosely attached to the pia, the extravasation of blood occurs more rapidly and extends with greater ease both upward into the cerebral subarachnoid space and downward into the spinal cavity. Clotting does not occur as readily and there is a greater tendency to prolonged bleeding.

Two other important symptoms which are found occasionally in spontaneous meningeal hemorrhage are the ophthalmoscopic findings and the phenomenon of massive albuminuria. The most important fundus changes are the occurrence of large retinal hemorrhages. In Case 3 of my series a large retinal hemorrhage was found in the temporal half of the left disc and a small one in the right eye. Symonds observed a similar condition in three of his cases. Postmortem findings in each one revealed an aneurysm of the internal carotid artery. Unfortunately, no autopsy could be obtained in my case.

In Neal's[4] series of thirty-five patients, twenty-one made a satisfactory recovery. In Symonds' 124 cases reviewed from the literature, in whom the hemorrhage was due to arteriosclerosis or ruptured aneurysm, the mortality rate was approximately 80 per cent, while in those cases of unknown origin and mainly in the young adult, only 44 per cent died. Three of our patients recovered and four died.

The most important therapeutic measure is repeated spinal drainage. It has been advised that during the bleeding period, where the increased

intracranial pressure has a tendency to check the hemorrhage and to hasten coagulation, a lumbar puncture is contraindicated except for diagnostic purposes. If too much spinal fluid is withdrawn at this time, sudden exitus may occur, probably because of an increase or recurrence of the hemorrhage. This is perhaps what caused the sudden death in our first case. Later on spinal drainage should be repeated at regular intervals, both for therapeutic purposes and for symptomatic relief from the severe headache and the other irritative phenomena. Furthermore, attempts should be made to increase the coagulability of the blood. For this, horse serum intraspinally and other hemostatic drugs are indicated.

The following seven case reports are illustrative of spontaneous meningeal hemorrhage:

The first case was a female, aged 44, seen in consultation with Dr. George Earl. Her family history was negative. Patient suffered frequently as a child from severe headaches, which were entirely relieved by wearing glasses. At thirty-two years of age she had a fall from a swing and was unconscious for a short time. For the past three years she had been in the best of health. After eating her mid-day dinner she went to her room and about four hours later someone heard a commotion and found that the patient had fallen down stairs. She had vomited and was semiconscious. With help she walked upstairs, but soon developed a restless, delirious state. This condition lasted until her death, six hours later.

An examination revealed that the patient was cyanotic; her breathing was stertorous. The reflexes were normal; there seemed to be a slight flaccid paralysis of the left lower extremity. The background of the eyes was normal. There was no involvement of the cranial nerves. The physical examination was negative. The blood pressure was 90 mm. Hg. and the urine was normal.

We suspected a pachymeningitis hemorrhagica or an acute meningitis, and advised a lumbar puncture. This was done and apparently pure blood, under pressure, escaped from the needle. During the process of the lumbar puncture the patient suddenly died.

The centrifuged spinal fluid gave a heavy, reddish precipitate, leaving the supernatant fluid a yellowish color. The examination of the precipitate showed many normal red blood cells, a few polymorphonuclear leucocytes and a few lymphocytes. The Wassermann was negative. No bacteria were found.

A postmortem examination was performed twenty-two hours later. There was nothing particular to note in the organs of the thorax and abdomen except an hour-glass stomach. The skull was of normal thickness. The dura was nowhere adherent. There was no indication of a fracture of the skull. When the dura was opened the brain was found bathed in blood. Blood-clots were seen, especially at the base of the brain. The blood was readily removed by washing and a small ruptured aneurysm, about the size of a hazelnut, was found near the bifurcation of the left posterior cerebral and the posterior communicating arteries. Cut sections of the brain were normal on gross examination. It is of interest to note that there were no previous symptoms indicative of an intracranial lesion.

Case 2* was a female thirty years old, a housekeeper, seen in consultation with Dr. D. L. Dawson, Rice Lake, Wisconsin. Her family history was unimportant except that her mother died at sixty-two of splenomyelogenous leukemia. Her personal history revealed an appendectomy at the age of twenty and attacks of hoarseness and chronic nasal catarrh for many years. She contracted a "severe cold in the chest" a few weeks ago, which had entirely subsided before the onset of the present illness. She was taken suddenly ill with an excruciating headache in the occipital region, with rigidity of the neck and with vomiting. These symptoms gradually increased in intensity. She was extremely restless and no relief was obtained with 10 grain doses of barbital every four hours. The neurological examination was negative except for a slight rigidity of the neck. During the next three days a positive Kernig developed, and the rigidity of the neck became more marked. Her temperature was normal until the fourth day, when it rose to 100.2 F. The patient was confused and the irritative meningeal symptoms were more pronounced. A lumbar puncture was performed and 60 c.c. of spinal fluid, under great pressure, was removed. This was uniformly hemorrhagic, formed no coagulum, the supernatant fluid was definitely yellowish, and no bacteria were found. The headache was greatly relieved and the general condition improved. Forty-eight hours later 45 c.c. of spinal fluid under increased pressure were removed. The fluid was yellowish, contained a trace of globulin, 55 cells per cm., mostly lymphocytes, a negative Wassermann, and a negative colloidal gold curve. The rigid neck and Kernig sign were still present but were less pronounced, otherwise the neurological examination was negative. The backgrounds of the eyes were normal, urine negative, blood pressure, systolic 125, diastolic 75. Three days later 20 c.c. of clear spinal fluid under normal pressure were removed. The patient made an uneventful recovery in three weeks.

Case 3 was that of a woman, thirty-six years old, a stenographer. She was seen in consultation with Dr. D. Kalinoff, Stillwater, Minnesota, November 26, 1925. Her family and personal histories were negative except that she suffered from an occasional headache, apparently not migranous in type. On October 26, 1925, while reading, she suddenly became blind in the right eye. Vision gradually returned in twenty-four hours. She was seen by Dr. S. G. Larabee of St. Paul, October 28, at which time her fundi were negative, and with proper glasses her vision could be brought up to normal. She remained well until November 23, at 12:30 A. M., when, while returning home from a party, she was suddenly seized with excruciating, diffuse headache. This was so severe that she was unable to continue with her walking and she was taken into a nearby house. Within one-half hour persistent emesis developed. She was given ½ gr. of morphine within the next half hour, without any relief from the headache.

*Previously reported by Dr. D. L. Dawson,[5] Wisconsin Medical Journal, February, 1924.

The neurological examination was negative throughout except that both knee jerks were moderately increased.

Her headache continued until the next day when a lumbar puncture was performed and 20 c.c. of spinal fluid, uniformly bloody and under markedly increased pressure, were removed. Her headache was somewhat relieved and her general condition improved, until the late afternoon of the following day, November 25. She then gradually became stuporous and continued in a heavy sleep all night. She could be awakened with some difficulty, after which she was rational and answered questions coherently. When undisturbed she would soon return to her stuporous condition.

I first saw her on November 26, 1925, at 3 P. M.. She was stuporous, but could be aroused, talked coherently, and recognized people. The neurological examination was normal except that her neck was rigid. There was a positive Kernig bilaterally: both knee jerks were sluggish. Babinski on the left was negative; on the right, questionable.

The examination of the backgrounds of the eyes revealed the following: On the left, a large recent retinal hemorrhage extending over the entire temporal half of the fundus. The nasal half appeared normal. On the right, a small recent retinal hemorrhage on the temporal side.

The physical examination was negative. The urine was normal except for a trace of albumin.

Twenty c.c. of spinal fluid were removed, under increased pressure, uniformly hemorrhagic; no coagulum formed on standing. The supernatant fluid was yellowish. The sediment contained many red blood cells and leucocytes but no bacteria. The Wassermann was negative. Blood pressure, systolic 140, diastolic 80.

After the removal of the spinal fluid she appeared less drowsy. However, her headache increased in severity for about ten minutes, then gradually subsided. She improved for a few days under repeated lumbar punctures and thrombo-plastine hypodermically. She then gradually became worse, her irritative symptoms became more pronounced, and she died December 1, 1925.

During the first three days of her illness her temperature and pulse were normal, then gradually increased to the time of her death. No postmortem was obtained. This was the only case in our series that manifested any changes in the fundi of the eyes.

Case 4 was a male, aged 67, seen in consultation with Dr. H. Aldes, January 18, 1926.

The family and personal histories were negative except that ten years ago he had an attack of acute nephritis with a blood pressure of 210. His wife states that he was perfectly well until 8 P. M., January 14, 1926, when, while playing cards, he suddenly developed an excruciating occipital headache, accompanied by vomiting. He was very restless during that night. His headache and vomiting continued. He became somewhat confused and very irritable. His symptoms gradually became more pronounced, and I first saw him four days after the onset of his illness.

He complained of severe occipital headache and a stiff neck. He was confused and disoriented, thought that the date was Friday, February 17, 1921. (It was Monday, January 18, 1926.) His pulse was 80; temperature normal; blood pressure, systolic 152, diastolic 78; urine normal. His cranial nerves were normal except that his pupils were miotic but responded to light and accommodation. All extremities and reflexes were normal; Babinski negative; no ankle clonus. He had a rigid neck and a definite Kernig sign.

Sixty c.c. of spinal fluid, under increased pressure, were withdrawn. This was uniformly hemorrhagic, contained many blood cells, a negative Wassermann, no organisms, and the supernatant fluid was yellowish.

Daily lumbar punctures were performed. The clinical picture gradually improved and the spinal fluid became less hemorrhagic. On the evening of January 22 his abdomen became greatly distended, and the following morning he vomited large amounts of liquid material containing fecal matter. He evidently developed a paralytic ileus. Soon after, his headache became more pronounced, and one hour after his attack of emesis a lumbar puncture was performed. The spinal fluid was under increased pressure and contained much blood. His condition grew worse and he died forty hours later. In all probability the excessive straining associated with the vomiting caused a recurrence of the intracranial hemorrhage. No postmortem could be obtained.

Case 5 was that of a woman, aged 35, seen in consultation with Dr. R. B. Schoch, October 9, 1924. Her family and personal histories were negative. She had been under Dr. Schoch's observation during the preceding nine months for her pregnancy (primipara). Her urine and blood pressure had been normal throughout. Her pregnancy had been uneventful in every way and she was admitted to St. Luke's Hospital at 11 P. M., September 23, 1924, in labor. The labor was normal, although somewhat prolonged, and she gave birth to a healthy child at 4:15 A. M., September 25.

During her delivery, at the height of a very severe uterine contraction, she suddenly complained of an excruciating occipital headache. Chloroform was administered soon after and the patient delivered. At 8 o'clock the same morning her blood pressure was systolic 190, diastolic 88. Severe headache continued and the patient seemed somewhat confused, drowsy, and very restless. Her neck was rigid. While asleep there was some twitching of the muscles of the right extremities. She had to be catheterized. Her temperature was normal and pulse 120. She was unable to move her head because of severe occipital pain. All symptoms gradually increased.

On September 26, her pulse was 160, respiration 16, temperature normal. She became more stuporous and gradually developed a paresis of the right arm and leg. Her neurological symptoms remained stationary but there was a gradual physical improvement, and by 4 P. M., September 27, her pulse varied around 100. Her headache, restlessness, confusion, and paralysis continued, associated with periods of stupor; temperature around 100 F., pulse 110. On October 3 a lumbar puncture was done and 30 c.c. of spinal fluid were withdrawn. This was under increased pressure, uniformly hemorrhagic, contained many red blood cells, but no organisms.

Following the spinal drainage the headache improved, the restlessness subsided, and the patient appeared quite rational. Spinal drainage was repeated every second day

for five days, then daily for seven days, and after that at irregular intervals.

From 30 to 55 c.c. of spinal fluid were removed at each puncture. The hemorrhagic character of the fluid gradually subsided, the fluid became yellowish, and at the last drainage, October 21 (26 days after onset), it was clear and of normal color. Except for an excess of globulin, the bloody condition and the many blood cells, the spinal fluid was normal throughout.

On my examination, October 8, her cranial nerves were normal but the retinal vessels were somewhat distended; there were no hemorrhages. She had some paresis of the right arm and leg, bilaterally increased knee jerks, and a positive Babinski; Kernig negative; neck somewhat rigid. Blood pressure, systolic 130, diastolic 65.

On October 11 her paralysis had definitely improved and by October 20 the function of all extremities was normal. However, there was still some aphasia present, which also subsided after several months.

Two days after the onset of her acute illness, her urine contained a large amount of albumin and a few granular casts. This continued until October 8, when the urine became normal and remained so during her stay at the hospital. On October 1, her hemoglobin was 65 per cent; red blood count 3,770,000; leucocytes 19,400. On the day of her discharge, November 8, 1924, her blood pressure was, systolic 110, diastolic 75.

The early portion of this case history is very suggestive of an intraventricular hemorrhage or a hemorrhage into the internal capsule, but the rapid improvement following spinal drainage and the complete recovery from the paralysis exclude these two localizations.

Case 6 was a male, aged 33, seen in consultation with Dr. C. E. Hensel, July 23, 1923. His family and personal histories were negative except that at the age of ten he had an attack of otitis media. His present illness began July 6, 1923, when he was awakened about midnight with a terrific occipital headache. After taking aspirin he was able to sleep quite well the remainder of the night. The following morning he felt weak and tired and had a severe attack of emesis while at his office. He returned home at noon, because of headache and backache, rested for two days, then went back to his office for five days. During this time his headache and backache gradually became more severe and his sleep was poor and restless. On July 16, after he had finished his meal, he walked into the next room and suddenly became unconscious. This cleared up in about twenty minutes, after which he had severe headache, backache, and emesis for five days. The vomiting ceased but his headache continued. When examined on July 23 he was confused and irrational, complained of severe occipital pain and backache. His cranial nerves were normal, his neck rigid, a positive Kernig was present, knee jerks increased, no Babinski or clonus, no evidence of paralysis. All other findings were normal. The spinal fluid was under increased pressure, uniformly hemorrhagic, and contained many red blood cells. The supernatant fluid was yellowish, the Wassermann was negative, and there were no bacteria; the urine was normal except for a trace of albumin. Leucocyte count was 9,650, differential count normal. Blood pressure, systolic 128, diastolic 75.

Under symptomatic treatment and repeated spinal drainage the clinical symptoms gradually subsided and the patient made a satisfactory recovery. He was able to leave the hospital September 28, 1923. With repeated lumbar punctures the spinal fluid gradually became less hemorrhagic and returned to normal. The patient remained well except that he tired more readily than before.

Two years later, on July 18, 1925, he had a similar attack. His wife was awakened at 4:30 A. M. by the sound of his groans. He was conscious, somewhat rigid, and his arms and legs jerked occasionally. He was nauseated and vomited several times. He improved for an hour, then suddenly developed a terrific occipital headache, and some stiffness of the neck. He became very restless and irritable.

The neurological examination was negative throughout except for a positive Kernig and neck rigidity; blood pressure, systolic 116, diastolic 58; urine normal; leucocytosis 18,250; spinal fluid under increased pressure, markedly hemorrhagic, a negative Wassermann, no bacteria, sugar 0.111; temperature, normal; pulse 70.

He was given repeated spinal drainage and acriflavine intravenously. He made a satisfactory recovery from this attack.

During his second illness he was seen by Dr. Hensel and Dr. Riggs. Just before he left the hospital, September 2, 1925, Dr. Hensel kindly permitted me to examine him. His neurological findings were normal in every way and he felt well.

Recurrent attacks of spontaneous subarachnoid hemorrhage have been reported in the literature. Eskuchen's[6] patient had a recurrence in eighteen days; Goldflam's patient, in forty-two days. Matzdorff reports a case in which the second attack developed after seven years, while Simdowicz's patient had three attacks in three years.

Case 7 is that of a male, aged 46, seen in consultation with Dr. C. B. Teisberg, April 2, 1924. His family and personal histories were negative. On March 30 he developed severe headache and restlessness. He gradually became lethargic, complained of diplopia, and had a temperature of 102.

His spinal fluid was under pressure, clear, 9 cells, a negative Wassermann, a negative colloidal gold curve, sugar 0.11. A diagnosis of epidemic encephalitis was made. He slowly improved and after two months was able to be up and around. He made a complete recovery except that he lacked endurance, was easily fatigued, and had an occasional headache. The neurological findings were negative.

Nine months later, while riding in a streetcar, he suddenly developed a severe headache and soon after became unconscious. He was taken to the Ancker Hospital. He remained unconscious; his neck was somewhat rigid. He presented no evidence of paralysis. A lumbar puncture revealed a uniformly hemorrhagic spinal fluid. He died within sixteen hours. No postmortem was permitted. A diagnosis of spontaneous subarachnoid hemorrhage, secondary to arterial changes due to epidemic encephalitis, was made.

Inflammatory changes in the blood vessels of the meninges in an acute case of encephalitis have been noted by McKinley,[7] myself, and others. Otero[8] reported two cases similar to ours and states that Rathery and Netter have recently published instances of meningeal hemorrhage in the course of that disease. It is quite possible that in our case sufficient degenerative changes occurred in the blood vessel wall, with a resultant rupture and hemorrhage. In cases of sudden death with a hemorrhagic spinal fluid, in chronic epidemic encephalitis, this condition should be considered.

Although the characteristic symptoms of spontaneous meningeal hemorrhage are a hemorrhagic spinal fluid and evidences of meningeal irritation, other diseases may simulate this condition. The following two cases are illustrative:

Case 1 was that of a child seven and a half years of age, seen in consultation with Dr. Asa Johnson, November 18, 1925, with a negative family and personal history except for an occasional attack of headache and vomiting during the past two and a half years. Since January, 1925, she had three attacks, each of twelve hours' duration.

The mother stated that on November 17 at bedtime the child seemed somewhat restless but finally quieted down and slept well until 4:30 A. M. She then complained of severe headache and vomited. Soon after she seemed somewhat drowsy. Dr. Johnson saw her at 6 A. M., at which time she was semi-stuporous, restless, and apparently nauseated. When I saw her at 9 A. M., she was unconscious and restless, had a somewhat rigid neck, and a flaccid paralysis of her left face, arm, and leg. The right pupil was dilated and larger than the left. Both responded to light; both fundi were normal. There was paralysis of the left seventh nerve. The reflexes in the upper extremities were normal, but there was a flaccid paralysis of the left arm. Both knee and Achilles jerks were absent; there was no Babinski or clonus; there was a flaccid paralysis of the left leg.

The spinal fluid was under increased pressure, uniformly hemorrhagic, Wassermann negative.

The patient gradually grew worse and died one-half hour later.

A postmortem of the head only, revealed a large subcortical hemorrhage in the right cerebral hemisphere which had ruptured into the ventricles. Cross section revealed a degenerating glioma in this region, which was the primary cause of the hemorrhage.

Case 2** was that of a female, aged 30, married, seen in consultation with Dr. J. C. Ferguson, October 13, 1925.

The family and personal histories were negative. The family stated that she had been perfectly well. She left her home on October 12 at 8 P. M. to take part in a musicale and to visit a friend. A quarter to one that night the doorbell rang three times. When they opened the door they found the patient lying in front of the door apparently semi-conscious, bleeding from the nose, and a little blood on her stocking and on the porch floor. The family thought she had been struck by an automobile and placed on the porch. However, there was no sand or dirt in her hair or on her clothes, and no evidence of violence or external injury.

Dr. Ferguson saw her at 10 o'clock that morning, when her temperature was 102, pulse 100. The patient was semi-conscious, and her neck was slightly rigid. I was asked to see her about 8 P. M. The patient was still semi-conscious, resistive, and gave the impression of a catatonic dementia precox. When her arm was lifted she would hold it in that position and gradually drop it. When an attempt was made to open her eyes she would hold them tight. She was definitely resistive. Her neck was rigid. She had a questionable Kernig. All reflexes were normal. There was no evidence of any bruise on the head or on the body. She continually rubbed her forehead with her hand as if she had a severe headache. Her temperature at this time was 102.5, pulse 100, respiration 25, and her general condition was fair.

A lumbar puncture was done and about 35 c.c. of spinal fluid were removed, which was almost pure blood. Following the spinal drainage there was no special change in her condition. At 10 P. M. she died quite suddenly.

Permission was given for a postmortem of the head only. Between the scalp and the occipital bone was a small diffuse hematoma about 5 cm. wide and 10 cm. long. On opening the skull there was a diffuse hemorrhagic exudate extending over both hemispheres, with a small blood clot under the left frontal lobe and a large blood clot about the size of a small egg under the right frontal lobe. The convolutions of both frontal lobes were quite macerated. The skull showed a fracture in the occipital region extending about 7 cm. on the right side from the sagittal suture longitudinally through the occipital bone. On the left side the fracture line extended from the sagittal-lambdoid junction through the occipital bone into the foramen magnum. There were several short radiating fracture lines besides, beginning in the same area. The patient evidently rang her doorbell, fell, and the impact from the fall on the wooden floor was sufficiently marked to produce the occipital skull fracture with the marked contra-coup hemorrhage of both frontal lobes. The hemorrhage evidently was secondary to the fall and not primary, because its location and distribution were such as one would expect in a contra-coup lesion in relation to a blow in the occipital region.

This patient sustained a skull fracture with traumatic meningeal hemorrhage. Without the evidence of any head injury or without a postmortem examination, the diagnosis of spontaneous meningeal hemorrhage would have been the probable one.

CONCLUSIONS

The syndrome of spontaneous meningeal hemorrhage is sufficiently well defined to enable one to make the correct diagnosis.

A hemorrhagic spinal fluid, especially without definite localizing cerebral manifestations, is suggestive of this disease.

**Previously reported in the Journal-Lancet, December 15, 1925, Page 596.

Although the clinical course is frequently a stormy one, the prognosis is often not as grave as the symptoms would indicate.

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IRON AND BLOOD REGENERATION

"The history of anemia treatment with drugs is indeed a tale to make the judicious grieve." On the whole, iron seems to enjoy the most constant favor by practicing physicians. The clinical control of the treatment of anemia is difficult and the number of variables almost infinity. As a result, widely differing views as to the efficiency of iron preparations have been recorded. Less than four years ago, Whipple wrote that among the potent factors exerting a positive influence of hemoglobin formation, stands first blood, meat and cooked liver, hemoglobin and butterfat. He found iron and arsenic in the common drug preparations inert under the conditions of his experiments. Williamson and Ets subsequently concluded that inorganic iron is absorbed and may be found in the liver and spleen, but is not converted into hemoglobin and that animals made anemic by bleeding did not recover more rapidly when inorganic iron is given. Williamson believes that the efficiency of food iron is pronounced. Recently, Barkan found that digestive ferments do not liberate iron from hemoglobin. This means that, if the pigment facilitates blood regeneration, it is not so much iron as the complexes with which it is associated that determines hematopoietic efficacy. (Jour. A. M. A., April 3, 1926, p. 1075.)

THE ZOALITE LAMP

This is a device for producing radiant heat for therapeutic purposes. The heat is produced by a "resistor" which is heated by an electric current. The radiant energy emitted by this unit is not unlike the radiant energy produced by an incandescent body such as a bar of hot iron or the filament of a tungsten lamp. The therapeutic value of the Zoalite is precisely that of other sources of radiant heat. (Jour. A. M. A., April 3, 1926, p. 1091.)

SOME PSYCHOANALYTICAL CONSIDERATIONS*

FRANK WHITMORE, M.D.
St. Paul

Psychoanalysis as a method is to be distinguished from the speculations which psychoanalysts find so fascinating and which they sometimes carry to unbelievable lengths, as witness a story by Dr. White about Dr. Jelliffe.

Dr. White prefaced his story by saying that it seems fairly well established that the sense of time and rhythm are acquired in utero from listening to mother's heartbeats. He then went on to say that Dr. Jelliffe was attending a medical meeting and the question of the remarkable rhythmical sense of a famous composer of jazz music was brought under discussion. Dr. Jelliffe suggested that possibly his mother suffered from cardiac disease. The physician who attended the composer's mother was present. He said that she had suffered from heart trouble all of her life and had died of it.

The Viennese physician, Sigmund Freud, was the first to get beyond the purely descriptive stage in the study of the neurotic's symptoms, and into an interpretive attitude towards their production. It is largely through the impetus of his work that the vast new field of modern psychiatry has been opened. It is largely his work and that of his pupils who have diverged only slightly on which I shall dwell. Before proceeding with an outline of its development, I will attempt to explain some of the fundamentals necessary for an understanding of it. Of primary importance is the libido. Its definition is love or lust. It is an unfortunate term which has gained such widespread usage that it is impossible to discard it. Originally it had a strictly sexual meaning. It retains its sexual sense but in addition has come to include mental energy. In the sense of love, it is possible to love someone else or to love oneself. These two phases are spoken of as object libido and ego libido (self love). Considering them in a larger sense, object libido (outside interest) has to do with the welfare of the race, ego libido (selfish interest) has to do with the survival of the individual. It is possible to understand the theoretical workings of the libido

*Read before the Ramsey County Medical Society, St. Paul, Dec. 28, 1925.

only if it is viewed as a force or form of energy. It is characteristic of forces in general to seek equalization. It is characteristic of the force, libido, to seek equalization, but satisfied at one level it immediately moves to a higher level. It does this by means of conflict. To use a simile of White's, the hungry man is in a conflict with his desire for food. All of his tendencies are to bring about actions which will neutralize these cravings. When this is done, the hunger satisfied, the man is free from conflict at that level and the libido is free to transfer its field of battle to a higher level; to write a poem, perform a surgical operation or storm the citadel. The libido is constantly seeking higher levels for its expression, and the individual's capacity for accomplishment depends upon the surplus after it is satisfied at a lower level. The ability to transfer the conflict from a lower to a higher level is called sublimation. It is the libido that suffers injury from the sexual traumatism which Freud finds such a constant factor in the psycho-neurosis. The injury interferes with the activities and ambitious acomplishments of the individual. Unconsciously the person seeks to excuse the general inadequacy of the trend of his life by the production of certain symptoms.

I have in mind a case of psycho-neurosis which seems to illustrate very clearly how sexual traumatism interferes with the normal activity and ambition. It was a case of the compulsion neurosis, the so-called hand-washing neurosis. The young woman was washing her hands every few minutes during the day—a ceremonial which always suggests a sense of guilt. Lady Macbeth and Pontius Pilate are noted examples. Her hand washing was obviously associated with ideas of contamination from dirt, or bacteria from shaking hands or other sources. The necessity for washing her hands detracted from her general efficiency, but more distressing was the narrowness of her interests and activities. I suggested to her at one time that she was as strictly confined by her illness as if she was in prison. This suggestion was met by an emotional outburst and she cried convulsively for about half an hour. The outburst was the result of a rather carefully planned coupe for producing just such an explosion which was the mental catharsis of Freud and Bleuler. Let us follow up the analysis as an example of how it links together repressed incidents which have a distinct bearing upon the production of her difficulty. We will omit certain sexual features which may be taken for granted. The girl's father was a drunkard and when she was a child it was the habit of her two grown brothers to attempt to get him out of saloons before his money was spent. Frequently they would fight with him, and the young girl, seeing these fights, feared that they would murder him, and be sent to prison. Sometimes at home the father would abuse and threaten her mother and the younger children. This fixed a dread and hatred of her father in her mind, because she feared he would murder them all in some of his drunken rages. The idea of murder was thus brought to her attention, and struck such terror into her heart that she began to fear the very word. Newspaper accounts of murders by poisoning made her fear that she might some day accidentally poison or contaminate something which would kill someone. This idea extended itself to her thoughts and she became obsessed by a dread that she would wish evil to someone else and that her wish would bring evil upon them. When it happened that someone whom she had wished might die did actually die it seemed to her that her fears had been confirmed. As her obsession grew and she became more confirmed in her belief that her thoughts and her hands were actually harmful to those around her, she had the startling misfortune of having her father die just as she touched him. This made her in her already overwrought condition feel directly responsible for his death. The feeling that she had been guilty of murder caused her to begin the habit of washing her hands, which habit, later, when the thoughts had been repressed, became an outlet for the nervous activity which remained. In addition to the habit of washing her hands so frequently, which naturally interfered with things which she should have been doing, her activities were still further restricted by a sense of shame which she felt on account of certain sexual delinquencies. This caused her to shrink from normal social contacts. With the additional idea of inflicting penance upon herself, which in a sense atoned for her sins, she gave up all pleasure.

The idea of being a prisoner was brought to my mind by one of her dreams, in which her mother and herself were chased by two men through a big house with many rooms and corridors and surrounded by a high wall. She finally lost her mother and escaped from the house.

The dream interpreted meant that she was a pris-

oner to her difficulties. The chase in the dream meant pursuit or courtship. At the time of the analysis she was engaged to a young man, but her mother objected on two scores,—first, the girl's nervous condition and secondly because she was very fond of the girl. In a dream, which, with one notable exception, according to Freud, is always wish-fulfilling in character, we see her eluding both the confinement of her difficulties and her mother's surveillance.

Looking at the larger aspects of this case we see that some phases of her sexual faults interfered with the normal direction which her activities should have taken. Thus we have an example of sexual traumatism causing injury to the libido. Her unconscious excuse for the general futility of her life was to seek refuge in an illness, the most conspicuous symptoms of which was hand-washing. The interpretation of the dream was one of the methods of approaching the underlying cause of her trouble.

To proceed to Freudian theories, Wertheimer,[1] in his very clear description of the subject, gives the development of Freud's theories in five stages.

In the first stage, Freud saw in sexual trauma the chief contributing factor in the production of the neurosis; at this stage Freud, as he later pointed out, overemphasized the importance of seduction in infantile life.

In the second stage Freud emphasized, in contrast to the infantile sexual trauma, his well known wider conception of sexuality, which he described in his book, "Three Contributions to the Sexual Theory."

In the third stage the important concept of narcissism was introduced. Narcissism has been described clinically by Nache as a sexual perversion in which the individual loves himself.

The fourth stage of Freud's theories is expressed in his book, "Beyond the Pleasure Principle." It contains speculations regarding the origin of the traumatic neurosis, as his attention was directed toward it by the shellshock cases during the war. Two facts seemed pertinent in the production of this neurosis,—first, the element of fright and, secondly, that if an organic wound of any considerable extent was produced, the neurosis did not occur. Regarding the first of these, Freud distinguishes between anxiety, fear and fright. Anxiety is a state of anticipation of danger and of preparation for it, even if the danger is unknown. Fear is directed towards a definite object. Fright is characterized by the element of surprise and thus occurs when, without preparation, one is confronted with a danger situation. In the traumatic neurosis the anxiety preparation is lacking. Anxiety, in fact, would prevent the traumatic neurosis. Fright is what causes it. Freud therefore speaks of it as a fright neurosis. Anxiety, viewed as a preparation against danger, has a special significance in relation to the traumatic neurosis.

Freud explains the preventive function of anxiety by introducing the concept of defense against stimuli. The living organism has not only the function of reception of stimuli, but also the more important one of defense against stimuli. The organism has to protect itself against being overwhelmed and crushed by the multitude of impressions continually pouring in upon it from the outside. It has to exclude most of these impressions and receive only a few which will serve as samples of the objects in its environment. The anxiety preparation causes a peculiar distribution of libido which prevents a breaking down of the defense against stimuli. Substituting Jung's term, "hormone," for libido, in this theoretical consideration, you can for example conceive of the organism distributing certain hormones or hormonie throughout the body as a preparation for the reception of greater than usual stimuli and thereby strengthening its defenses against the expected danger.

If an organic wound occurs at the time of the original fright situation the ego libido investment of the suffering organ creates a beneficial distribution of libido and thus prevents the traumatic neurosis. In other words the overwhelming impression created by the wound and its attendant threat to life throws up an impermeable barrier against other stimuli.

Freud further modified the principle that all dreams are wish-fulfilling in character, because of the tendency of the patients suffering from this neurosis to dream repeatedly of the terrifying incident.

My own views on the subject differ somewhat. Accepting all the factors in the production of the neurosis, it seems to me that he disregards certain other factors which enter into it which we know from experience to exist. For instance, the element of neurotic temperament. Most of the cases which I examined during the war showed evidence of having had many of the characteristics of this

type of personality before the onset of the traumatic difficulty. Other elements which may enter in are prolonged anxiety, impossibility of adjustment to an intolerable situation, and extreme fatigue.

I examined a young aviator at Camp Funston who had been shot down from a height of 1,500 feet by an enemy plane with which he was exchanging fire. He was aware of the danger before the actual casualty took place, and remembered what took place as the plane shot toward the ground until the last few feet. Fortunately, the plane caught in some trees and he escaped with a fractured arm and dislocated shoulder. Here both anxiety preparation and an organic wound occurred and yet he suffered from an exceedingly severe traumatic neurosis. I believe that this was due to a terror so overwhelming that it broke through all of his defenses. Therefore the anxiety preparation is only effective within limits and neither does the major wound invariably prevent the neurosis.

The fifth stage deals with the unconscious part of the ego as a hypothetical consideration. Its conjectures are of an entirely abstract nature and have little practical importance excepting as they help us to a better understanding of the practical workings of the actual psychoanalytic method, its limitations particularly.

Psychoanalysis as a procedure is an inquisitive delving into the psychological processes. The object of the search is to bring to light some repressed and forgotten events which might have had a profound influence not only on the production of the present mental derangement of the patient but upon his character and personality. Provided the analysis is successful, the bringing of the repressed and painful thoughts back into consciousness is accompanied by an emotional outburst, the so-called mental catharsis. Theoretically this should cure the patient of his disorder and sometimes it does. Not infrequently the outburst is followed by an indescribable feeling of relaxation and relief. Then only too often the symptoms return. Repetition of the catharsis may serve to effect a cure, even if no new matter is brought to the surface. However, there will be a certain number who will remain uncured if the treatment be abandoned at this point. The knowledge of habits, responsive reaction and the estimation of personality with a view to taking measures to remedy any faulty adjustments in the life regime of the individual certainly has not been overlooked by psychoanalysts, for they were among the earliest to recognize that these habits were due to the nervous condition, the cause of which they have striven to remove. The next logical step is to remove the habits. In other words, while the strict Freudian procedure limits itself to the ferreting out of the cause it must be and is admitted by psychoanalysts, that the procedure so limited would in many instances be incomplete. But psychoanalysts deal not only with the cause of the neurosis but with the effect, for a neurosis is never without its effect on the personality of the individual suffering from it.

There are certain symptoms common to all neurotics and in addition to the usually described ones of nervous tension, irritability, inability to concentrate the attention, lack of interest, depression of variable depth, an appetite for sympathy and easily aroused emotions, certain traits of character stamp the neurotic.

Freud, generalizing on the subject, believes that sexual traumatism interfered with the dominant tendencies in the mental life of the neurotic and that the individual's defense against this interference constitutes the neurosis. This means essentially that the interference lies principally with expression, creation or accomplishment on the part of the patient.

Therefore, the neurotic personality is an inactive and an imaginative one. The ability to create tense situations is to my mind one of the outstanding features of neurotic's personality. The novels of Joseph Conrad, in which the interest is sustained by the author's ability to picture all of the mental striving, weakness, anguish and various psychological difficulties of his principal character under disastrous circumstances, afford an excellent example of the working of such a neurotic mind plus the power to express itself magnificently.

The neurotic pictures to himself all of the difficulties in a task and then too often doesn't perform it. Day dreaming replaces action. These fantasies not only replace action but they serve to fill in some flagrant defect in character. He often pictures himself to himself as the kind of man he would like to be but isn't. The indulgence in fantasies leads to inactivity, and consequent lack of force, initiative and aggressiveness. Postponement of action leads to inability to arive at a decision and a passive attitude towards situations which call for action. This indecisiveness may be carried

from the very greatest to the most inconsequential acts—or again indecision may be replaced by attention to unimportant details. The picture of King Louis the Sixteenth planning a lock for the cabinet to hold his jewelry while the revolutionists are deciding to dethrone him and kill himself and his family has always impressed me as a particularly illuminating phase of dawdling. Timidity, lack of enterprise, overscrupulousness, idling, time wasting, introspection and moping are other manifestations. Dreamy states with the accompanying sensation of unreality are frequent and, in my opinion, are due to lack of attention to the stimulus of events from the outside world, introspection and perhaps unconscious striving to place the disagreeable reality as a whole out of mind—in other words, to recall the unconsciousness of the sleeping state. Reflex memory stimulated by half familiar phrases or situations may also bring it about.

In effect, timidity, irritability, introspection, lack of color in personality and hypersensitiveness make the neurotic an unsociable being, while too much solicitude, or lack of patience or understanding on the part of the family, usually completely isolates him from both society and family. Adler.[2] in his Individual Psychology, has wrestled with this phase of psychoanalysis. In this country, contemporaneously, Sidis,[3] Morton Prince,[4] White[5] and others had entered on it from the purely descriptive side and in addition suggested the rather obvious readjustments to overcome the social and family faults. The National Committee of Mental Hygiene has been responsible for the large program of installing psychiatric clinics throughout the country in an attempt to recognize earlier and follow more closely cases brought before them. One of the most interesting lines of investigation, and one which seems most pregnant of good, is the branch of mental hygiene dealing with the guidance of children, and various Child Guidance clinics have been established, with a view to earlier recognition and prevention of the development of personality and conduct disorders.

While psychoanalysts are primarily interested in abnormal psychology, the necessity for knowledge of normal personality as a means of judging abnormal types is at once apparent. The tendency of many interested persons has been to divide all men into two groups. These have been called by various names. William James' division[6] of the "tough" and "tender" minded men is suggestive. The "tough" minded being the realists who demand the facts of life and act on them; the "tender" minded ones the classicists capable of abstract contemplation. More recently, Jung,[7] Kretchmer,[8] Bleuler[9] and Brill[10] have again depicted two well marked types. The first type is the independent, self-contained, self-sufficient person. Association with people is not a necessity with him, nor is it necessary for him to display any sort of emotionalism. He is constantly striving along new paths of endeavor and never satisfied to travel the well-trodden ways. His productions are usually unfrequent, but his trend is toward perfection. He has little liking for people, uses them indiscriminately and influences them without any understanding or particular attachment to them. George Washington, who has been described as silent, thoughtful, and little disposed to conviviality, seems to afford the example of this type. So does Woodrow Wilson in our own day. Brilliant, forceful, intensely egotistical, able to influence people without being close to anyone; friendly with people as long as they were useful, but discarding their friendship unscrupulously if they did not conform to his needs. This type corresponds to the egocentric individual described by Freud. The opposite type is essentially a social being. His feelings influence his thoughts and actions. His interests lie with people and he is usually good company and lovable. He reacts adequately to every emotional situation. He is lively and animated. He is domestically and socially a success, because he understands and cares for his fellow beings. Sir John Falstaff is the type. These brief sketches designate two personalities. One emotionally unresponsive, and the other expressing his emotion as he feels it.

Independence of thought and action combined with the ability to repress emotion and hoard energy give to those endowed with good intelligence and the necessary perseverance an inestimable ascendency over the opposite type.

The emotionally responsive individual's attributes fit him to be a part of the masses. While these emotional characteristics are in general quite aside from the individual's power to accomplish, the sphere of accomplishment will be more or less designated by the type of personality. The social being, interested as he is in people and their entertainment and comfort, might be expected to prefer such things as would add to the welfare of the people. They are the musicians, artists, story tell-

ers, physicians and architects; the socially amenable and the upholders of law and order.

The independent unresponsive type is fitted temperamentally for affairs rather than people; consequently, it is more easy to designate people of prominence among them. Rulers should be of this temperament. The Nordic strain has a preponderance of the emotionally unresponsive in it, but even among the Nordics, geographical and climatic conditions seem to influence the type.[4] The affable pleasure-loving southern gentleman and the penurious monosyllabic Puritan were both from England. It is easy to imagine either one of these types being subject to normal or exaggerated fits of elation or depression. For example, Abraham Lincoln's reactions are said to have been unresponsive and it is known that he suffered from prolonged spells of melancholia. Likewise, in dealing with abnormal minds the personality of the individual undoubtedly influences the production of symptoms in a given case.

In a paper of this sort it is impossible to do more than outline some of the considerations entering into such an animated, vigorously developing subject as psychoanalysis. Inconsistencies must be present in the delineation of such a pioneer field. This, however, is not to be deplored, for, as someone has said, "The only truly consistent person is a dead person," and psychoanalysis is nothing if not alive.

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X-RAY AND METASTASES IN BREAST CANCER*

W. A. Coventry, M.D., F.A.C.S.
Duluth, Minnesota

Beginning with the year 1918, when the medical literature contained a large number of references to the use of *x*-ray both in preoperative and postoperative cancer of the breast, and not having been satisfied with the results obtained previous to that time from this dreaded disease, I began to keep a more accurate record of all cases operated on by myself as well as by several of my colleagues. We were all of the opinion that possibly the use of *x*-ray would have a tendency to either cure or delay the fatal results in cancer of the breast. I am frank to state that previous to 1919 I was discouraged with the results obtained in these cases. At the present time I am more discouraged than ever at the results of the so-called "cure" of breast cancer patients who have been operated upon by myself and my colleagues. A careful study of these cases has also brought forcibly to our attention the many avenues of metastasis that may occur in breast cancer.

Of the ten patients operated upon in 1920, eight are dead, two are living, but have recurrences. Of the seven operated in 1921, five are dead, and two have recurrences. Of the nine operated in 1922, eight are dead, none have recurrences and one is living. Of the eight operated in 1923, two are dead, two have known recurrences, and four are living and well. Of the seven operated in 1924, five are dead, two are living, no recurrences. Of the six operated in 1925, one is dead, four are living, and two have recurrences.

This totals forty-seven cases in the five-year period. Twenty-nine, or sixty per cent, are dead. Six, or 10 per cent, are living with known recurrences. Fifteen, or thirty-one per cent, are living. Of the fifteen living, eleven were operated within the two-year period.

Of those dead, all except two died from cancer metastasis. The one exception died from lobar pneumonia which we were able to prove was a metastatic affair, and the other died of a long standing diabetes.

Of those living with recurrences, one recurred in

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the skin on the operated side, two have carcinoma in the opposite breast, and two have recurred in the supraclavicular glands of the neck, and one in the spine.

Fortunately, there are a few still living without any signs of recurrence, but the five-year period has not yet passed for them.

A review of these statistics certainly is not encouraging.

The type of operation used in all these cases was the radical operation, with two exceptions. By "radical," I mean removal of the pectoral muscles, major and minor, removal of the wide areas of skin and breast tissue, removal of the fascia down to the ribs and that extending up to the clavicle, removal of the axillary glands and gland-bearing area.

Eighty per cent of these cases had a preliminary treatment over the breast and the gland-bearing area in the axilla with *x*-ray, the average dose being: 5 milliamperes, 110 K.W., 9-inch spark gap, 10-inch focal distance from the skin, 5 mm. aluminum filter, 15-minute treatment.

Operation followed at varying periods from two days to one week following the initial dose of *x*-ray.

Ninety-five per cent of all cases have had postoperative *x*-ray therapy, the treatments varying from two to as high as twelve, in varying periods from two to three weeks apart. In some, the dose has not been as great as in others, but the above-mentioned dosage has been attempted as a standard. Marked nausea and so-called "*x*-ray sickness" sometimes interfered. In fact, this dosage of *x*-ray was to many of the patients decidedly disagreeable, and it was only by considerable persuasion and, of course, in the hope that the treatment would be decidedly beneficial, that we were able to prevail upon many to continue with the treatment.

It is admitted that this dosage of *x*-ray is not the maximum dosage that can be delivered, but it is an average that can be obtained from the ordinary machine. My observations of the deeper *x*-ray therapy on the patients of others has not made me believe that the results are any better than those here reported.

The observations of Tichy, as reported by Davis, are indeed illuminating and I quote:

Group 1: The cases treated during the years 1904-1914 were not *x*-rayed after operation.

Group 2: The cases treated during the years 1914-1917, scar *x*-rayed lightly after operation.

Group 3: The cases treated during the years 1918-1919, intensively *x*-rayed after operation.

Table 3 gives the results at Marburg reported by Tichy, the results at Tubingen reported by Perthes, and the results in Parry's Clinic at Leipzig as reported by Kastner, all using the same groups.

As will be seen by studying the table the most unfavorable results were with the cases intensively *x*-rayed. It was especially noted that more cases died of metastases and the internal metastases were more numerous and very marked among those *x*-rayed intensively.

In our series we have never before observed such apparent rapid metastasis, and metastasis into so many portions of the body, as this little study has revealed. Again quoting Davis: "In my own experience for a number of years the *x*-ray has been used postoperatively in most cases, but I am not yet convinced that it adds to the chance of cure and in some cases it has seemed to be detrimental."

Our observations on metastasis have confirmed those of Handley as to the avenues of invasion. These avenues of metastasis are:

(1) The axillary glands; (2) into the clavicular chain of glands; (3) into the chest wall and mediastinum; (4) into the peritoneal cavity; (5) local recurrences in the skin; (6) into the bony or skeletal part.

Our series show that 95 per cent had axillary involvement before operative interference. These cases, however, were operated, being well aware of the fact that much has appeared in the literature advising against removal when the axillary glands are involved. I am, however, certain that if the axillary glands are involved, one may at least operate. We have observed that in those with axillary involvement, that were followed with *x*-ray treatment, especially into the axilla and over the breast area, only 2 per cent have had recurrences in the axilla of the side that was operated upon.

There were four cases in which there was metastasis into the clavicular group of glands, either subclavicular or supraclavicular. The more recent literature tells us that these cases should not be operated upon under any circumstances. Our observations have led us to believe—although we have operated upon these cases—that the opinion not to operate is much better than to operate, because these patients in whom we have found supraclavicular glands, in spite of the intensive *x*-ray

treatment, have rapidly become worse and shown metastasis elsewhere.

Metastasis through the chest wall to the mediastinum and lungs has been observed in only two cases. These were, however, cases in which there was lung involvement demonstrated, and whether they were primary through the chest wall, or whether they were due to malignant emboli or metastasis from some other source, we were unable to determine. However, we had no cases in which there was known metastasis through the pleura.

Carcinoma in the opposite breast occurred in two cases of the series, one of these being in a nursing mother.

There have been four cases in which carcinoma later developed in the liver, but these were also associated with metastasis to other parts, so we have been unable to determine whether the liver involvement was secondary to the breast involvement, or whether it was secondary to a metastasis that already had taken place in other parts of the body.

Local recurrence in the skin has occurred in only one case. Our observations previous to 1920 showed that local recurrences to the skin occurred comparatively frequently, but I am of the opinion that the treatment with *x*-ray has undoubtedly retarded the occurrence of metastasis in the scar or in the skin over the removed area.

Metastasis in the skeletal bones, especially the spine, the pelvis, and the heads of the femurs, in this series have been most prominent.

Pain in the hips, in the pelvis, or in the back, after an operation for carcinoma, even before definite evidence can be found by *x*-ray, is a very characteristic sign of metastasis. This pain is very persistent and intense. More particularly is this true in cases of spinal metastasis. The frequency with which metastasis into the skeletal parts has been observed in this series, certainly leaves the impression that our use of *x*-ray seems to have scattered metastasis to remote parts rather than to have retarded it as we had hoped.

In the order of frequency, metastasis has occurred in the head of the femur, ilium, spine, sternum, the ribs, skull, and the lower jaw.

We have not yet seen a case of metastasis in the skeleton below the head of the femur.

The treatment of metastasis, especially in the skeletal parts, by the use of *x*-ray, has not been satisfactory. Prompt and better results are recorded by the use of high voltage dosages, when the pain only is said to be relieved.

Metastasis into the skeletal parts can only be determined by repeated *x*-ray pictures of the parts suspected of involvement, and in the early stages only by the closest scrutiny.

It is generally agreed that the degree of malignancy in carcinoma is due to the type of cell found in the tumor. Tumor masses showing hyalinization and fibrosis generally develop less rapidly, while those containing cells of a more embryonic type speak for a shorter life. The unknown quantity of the degree of resistance of the patient must also be taken into consideration. These facts have been well shown by McCarthy and Sistrunk, in a very admirable work. It is generally recognized that the size of the tumor in the breast is of no particular prognostic value, but that the involvement of palpable glands decreases the chances of a favorable outcome more than one-half.

All of the cases operated and reported here have had pathological examinations by competent pathologists. Those found to be of the scirrhous type have lived longer than those in which there was marked mitosis.

As one grows in experience, one comes more to the belief that it is better to give the patient the benefit of the doubt and remove all fibromas, cystic mastitis, so-called "lump in the breast"; this is a much safer procedure than to allow them to remain until a gross diagnosis of cancer can be made. In spite of all the cancer propaganda, there still remains a large number of people of average and more than average intelligence who come "too late" for the best results.

Also, one must come to this conclusion: When metastasis has taken place, the cancer has undoubtedly spread beyond the control of the surgeon, and one must conclude that these patients would be far better off without operation. It takes more courage to refuse to operate than to say operate.

Our observations would show us that, in view of the fact that skeletal metastasis is so common and when once found the prognosis is hopeless, it is surely better practice in all cases of breast carcinoma to take roentgenograms of the ilium, head of the femur and the spine. If metastasis is found, it would be very much better to refuse to operate and to attempt to treat palliatively, and I feel sure that the ultimate outcome will be as favorable, if not more so, and that life will be prolonged by such a procedure.

Our observations also convince us that the use of *x*-ray preoperatively and postoperatively certainly has not shown the results that were hoped and expected of it, when this series began. Whether the dosage has not been sufficient, remains an open question. I am becoming more and more convinced that postoperative *x*-ray treatment is only effectual in preventing local recurrences and relieving pain, and that from clinical experience it does not prevent metastasis but has a tendency to scatter metastasis and hurry the end.

DISCUSSION

Dr. J. F. Corbett, Minneapolis: I want to thank you for presenting this paper. The only fault I can find with it is its brevity. It has suggested so many things to me. The whole paper was so full of inspirations that I hardly know where to begin the discussion. The thing that struck me first was this: That we are getting these cancers too late. I do not believe this is entirely the fault of the patient. Too many of them are operated at a late stage when they should have been operated early. Delay is not a good measure with cancer. Some cancers grow with extreme rapidity and some are very slow in growing.

I will have to confess a rather humiliating experience I had about the first of the year. I very carefully removed a tumor from a brain. It was not connected with the bone in any way. It came out so nicely and so easily that it aroused my suspicions that it was a metastatic tumor. I had it examined and it was a metastatic tumor from the breast. I examined the breast and found a nodule hardly as large as the tip of my finger that I removed simply for the purpose of diagnosis and found it to be a carcinoma. Now as humiliating as this experience may be, it nevertheless shows that we do get metastasis very early from very insignificant breast tumors. More than once I have been called to treat a fractured femur that I found was a pathological fracture and was due to tumor in the breast that had been overlooked both by the patient and by the physician.

Now in regard to diagnosis. It has been my habit in all tumors of the breast whether in young women or women of the cancer age when I am the least bit suspicious to remove a good-sized piece from the breast and have a microscopic examination made. It may be that at some time this procedure will be subject to criticism, but I believe it is the safest thing to do. One has to be careful to go very wide of the tumor and if at all suspicious, to remove a wedge-shaped piece from the breast. A cautery is recommended for this.

In regard to the question of the *x*-ray, I think I may be permitted to illustrate it by reporting a single case. This was a young woman who had a small tumor removed from her breast. It was examined and found to be carcinoma. For some unexplained reason, possibly the mental condition of the patient or something of that kind, no other operation was done. The young woman was given a long course of *x*-ray treatment. Finally the tumor became very obvious in the breast and I was asked to remove that breast. Sad to say, I did. I could find nothing in the axillary glands. The tumor had returned locally and a very extensive dissection was made and I took everything that possibly could be taken out of the patient's anatomy. In the portions most remote from original site, cancer was found, but nothing in axillary glands that had been treated with *x*-ray.

That patient in a few months developed metastases in the lungs, in the vertebræ, and every place that she possibly could. Now what did the *x*-ray do there. It did not influence the primary growth. We are told that *x*-ray must either kill or stimulate the cancer cells. It apparently held the cancer in check in the glands it could reach but did not control the cancer at the original site, where cells were assumed to be numerous. Deep *x*-ray therapy is found to make the patients sick. They vomit and feel miserable and I have yet to see a single victory from any of my cases where we have used the deep therapy. I think this: *X*-ray probably is in its infancy and we have not yet knowledge sufficient to either condemn or approve it.

Surgery in later stages of cancer cannot claim many victories and is still developing. I believe the same is true of *x*-ray therapy.

Dr. James Hayes, Minneapolis: At the meeting of the Post-Graduate Assembly in St. Paul, I was much interested in and somewhat surprised at some of the facts brought out in that very exhaustive review of carcinoma of the breast. The statistics concerning the therapeutics of this condition corresponded very closely with those presented to us by Dr. Coventry this evening.

It has been estimated that the average patient lives about three years from the time the tumor is first noted in untreated cases of carcinoma of the breast. With all the therapeutic measures we have at hand we are able to take but 30 per cent of those treated to the five-year period. This does not speak well for our present treatment of cancer of the breast. However, it is a decided advancement and we must put forth every effort to do better. Educating the public is not the greatest problem. They are fairly well educated now to seek medical aid early.

We in the medical profession should do better in the way of advising these patients. Dr. Coventry says 95 per cent of his patients already had palpable glands in the axilla. This is usually too late to cure these patients. We should recognize this condition earlier.

There is so much confusion yet among medical men that we frequently lead the patient to lose confidence in us because of our conflicting opinions.

This week we saw a young woman who had been advised by a prominent medical man to have both breasts removed at once because of the existing condition. She consulted another medical man. He told her there was no indication for surgery. We could see no indication for surgery. These cases are not conducive to gaining the confidence of the public; yet we see them very frequently. The medical profession should get together on so important a matter as this and establish some means of making it possible for every medical man to know how to advise these patients. Here, it seems to me, is the greatest field for advancement.

It has been suggested that a more radical operation be performed with the hope of curing these cases, such as removing the supraclavicular glands, some of the chest

wall or the umbilicus with the rectus muscle and fascia. This perhaps is poor advice, for we know in the great majority at least, the metastasis takes place in the axilla first. If the invasion has gone further than this, then it is only a hazardous guess as to the limits of the extension.

I don't pretend to compare my knowledge of pathology with that of Dr. Bell. But I am personally convinced that there is something in Broder's grading of malignancy.

Lee of New York some time ago showed a specimen of a carcinoma removed from the breast of an elderly woman. This was known to have been present for twenty years. At the same meeting he showed a specimen, or the picture of one, taken from the breast of a woman who died six months after the first appearance of the lump. Pathologists have not definitely explained this apparent discrepancy. Why can it not be explained according to this classification?

Perthes in 1920 aroused discussion as to the possible harmful effects of intensive doses of *x*-ray in post-operative carcinoma of the breast.

In St. Paul, Portmann, in his review, showed that out of twenty-six clinics only three had given favorable reports, and those three had not used the intensive doses of *x*-ray. In their clinic at Cleveland, there was 16.5 per cent recurrence in the first year post-operatively in the patients not treated with *x*-ray, 29.3 per cent in those treated with light doses, and 35.1 per cent in those treated by intensive doses.

However, we have all seen many cases which are obviously inoperable cases, those with extensive pulmonary metastasis or other inaccessible masses which are greatly relieved, at least, temporarily, by *x*-ray treatment. It does hold out some hope for them and even if it does not prolong life, it does often give them some comfort while they do live.

Perhaps when the biological reaction to radiation is better understood, the results with *x*-ray in these cases will be much better.

Dr. Coventry, Duluth: When I said *x*-ray scatters metastases, I meant to say that in my observation those cases that have intensive treatment and radiation seem to develop metastases much more rapidly than those not so treated. Whether it is due to increasing the activity of the cancerous cell, which I do not believe, or whether it lowers the resistance of the patient and in that way cuts down the fighting power against the disease, I do not know, but the latter seems to be more reasonable. I believe that we are going to discontinue *x*-ray entirely or else use very light doses. I am also of the opinion that all cancers of the breast should be put into four classes:

1. Those cases that have a simple nodule in the breast without any evidence of metastases.
2. Those having a nodule with metastases in the axilla.
3. Those having metastases in the axilla and in the supraclavicular glands.
4. The inoperable cases.

I believe that when we classify our cases before operation in one of these four classes, after a period of years we will be better able to tell just what our final results are going to be and what we can offer our patients as regards cure.

ULCER OF THE DUODENUM*

E. Starr Judd, M.D.
Rochester, Minnesota

A great deal of interest has been manifested in surgical treatment of ulcers of the stomach and duodenum since the earliest period of abdominal surgery. In performing operations on the stomach we all feel an unusually great satisfaction when striking results are obtained. Medical students who aspire to become surgeons probably feel that, if they reach the point of performing operations on the stomach, they will have attained the height of their ambition. Coincident with this interest a great deal has been written on the subject, and principles have been formulated which have quite well standardized operative procedures.

Within the last few years, because of unsatisfactory results in certain cases, attempts have been made to show that the plan of performing gastro-enterostomy for ulcer is wrong, and that instead it is necessary to resect part of the stomach in order to get rid of the glands that secrete the acid and thereby get rid of the irritation and prevent the formation of secondary ulcers.

In considering the problems connected with ulcer it is first necessary to separate the gastric from the duodenal. The gastric ulcer may be malignant, and therefore in order to obtain a satisfactory result it should be excised and gastro-enterostomy performed if the gastric ulcer is small and situated high on the lesser curvature. Otherwise, the same result can usually be attained more easily by removing the part of the stomach which contains the ulcer and then completing the operation as a resection.

In the case of the duodenal ulcer the question of malignancy may be disregarded. Primary carcinoma of the duodenum that resembles an ulcer is almost unknown, and it is a great satisfaction to know, when prescribing a conservative treatment for a patient with duodenal ulcer, that we are dealing with a definitely benign lesion.

Ulcers of the duodenum are usually situated on the anterior surface in the cap. Occasionally, they are found on the lower border and rarely on the posterior wall, some distance from the pylorus, lying in the head of the pancreas. Because of their

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proximity to the pancreatic-duodenal vessels, ulcers in this location are frequently the cause of severe gastro-intestinal hemorrhages. I have often found multiple ulcers in the duodenum, but with more experience in these cases, I am inclined to believe that one of the ulcers is primary and that the others are secondary. It is not unusual, on opening the duodenum to excise an ulcer on the anterior surface, to find a small spot of puckering congested mucous membrane just opposite the anterior ulcer. I have excised many ulcers situated on the anterior surface and disregarded those on the posterior, which are much smaller and more like areas of duodenitis than true ulcers, but I have never known such a posterior lesion to cause trouble later.

Some years ago I called attention to the fact that lesions in the duodenum as seen in the operating room are of two distinct types. One type is a true chronic ulcer with a crater, which has lost a certain amount of mucous membrane, in every respect resembling gastric ulcer. The other type, which is very common in the duodenum and is usually spoken of as an ulcer, is, in reality, not a true ulcer but a localized area of inflammation. Both types of lesion occur in the same place in the duodenum, and for a time we thought that duodenitis was only the first step in the development of an ulcer, or that it was evidence that the ulcer was beginning to heal. It was difficult to correlate these facts, however, when a duodenitis was found in a patient who was in the midst of an attack at the time of operation and who had been having symptoms of ulcer for many years. The inflammatory type of lesion is not infrequently found at necropsy. Definite duodenitis can frequently be produced experimentally in animals by injecting bacteria cultured from peptic ulcers into the circulation, so all the evidence that can be accumulated seems to show that a lesion in the duodenum may at times be a localized area of inflammation, and not a true ulcer.

Many of the papers presented on surgical and medical subjects begin by saying that the etiology of the condition under consideration is not well understood, and yet the etiology is the most important factor and usually offers the most interesting study on the subject. If the etiology can be determined other considerations are quickly settled. Duodenal ulcers occur much more frequently in males than in females, and patients most often present themselves for treatment at middle age. I am convinced that Jewish people have a greater tendency toward duodenal ulcer than do the other races. This may be a result of their habits of life, the food they eat, or possibly some susceptibility to a type of bacteria which produces ulcer.

There is satisfactory evidence to show that physiologic activity has to do with the cause of an ulcer and that infection with certain strains of bacteria plays an important rôle. Mann has shown experimentally that a jejunal ulcer develops in practically every instance if the bile, pancreatic juice, and duodenal secretions are diverted into the lower ileum so that they have no influence on the jejunum, and if the jejunum is anastomosed to the stomach so that the secretions from the stomach flow directly into it. He has shown further that, after the ulcer has become chronic, as they all do, it will promptly heal if the normal continuity of the intestinal tract is re-established. The experimentally produced ulcer is in every respect like the lesion in the human being called the chronic ulcer. These experiments leave no question as to the physiologic factor in the etiology of ulcer; they would also seem to support the radical operation for duodenal ulcer as, in order to prevent recurrence, it is necessary to eliminate the irritation caused by acid secretions from the stomach. These secretions are supposed to come from glands in the stomach on the lesser curvature, and in the pyloric and mid-gastric sections. To determine the result of excising this part of the stomach, Mann performed a series of experiments in which he first set aside the duodenum as he had formerly, then removed a considerable part of the lesser curvature, pyloric, and mid-gastric parts of the stomach and anastomosed the remaining segment of the stomach to the jejunum; ulcers formed in the jejunum as in the former experiments. He believes that the acid secretion comes from the glands at the cardia, also, and that secondary ulcers will follow resection just as they follow gastro-enterostomy.

Striking results have been obtained by Rosenow from his studies on the etiology of ulcer. With bacteria from ulcers removed at operation, or from an infected tooth, tonsil, or prostate of a patient who has an ulcer, he can often produce duodenitis and ulcers in animals, and furthermore can recover the micro-organisms from the lesions. The fact that at certain times he has recovered the micro-

organisms from the ulcers produced experimentally by Mann would seem to show that bacteria play a part in the production of such experimentally-produced chronic ulcers. Moreover, the immunization of animals by bacteria from ulcer before Mann's experiment is carried out, seems, in some instances at least, to hinder the formation of ulcer.

While the etiology still remains the most fascinating part of the subject of duodenal ulcer, the great practical question at this time is whether a radical operation is advisable or necessary in order to obtain satisfactory results. The percentage of unsatisfactory results obtained by gastro-enterostomy has certainly been greatly exaggerated by those advocating the radical procedure. According to the most careful statistical studies, 5 per cent would represent the highest number of secondary ulcers that form after gastro-enterostomy, although one report gives a percentage as high as 34. No operation could survive with that number of unsatisfactory results. Some persons seem to harbor a predisposing strain of bacteria or have a break in their physiologic balance so that no matter what procedure is instituted a secondary ulcer forms, and it is likely that these cases are the ones that give the trouble. The magnitude of the operative procedure required to remedy a case of jejunal ulcer makes a lasting impression, and is probably responsible for the feeling among surgeons that the condition is more prevalent than it really is.

Gastro-enterostomy is not an ideal operation, but the results of gastro-enterostomy in most cases of duodenal ulcer are very gratifying, and the operation can be performed safely. For these reasons it should continue to be employed in many cases of duodenal ulcer. If excision of the ulcer with reduction of the sphincter activity can be performed just as safely as gastro-enterostomy, I believe this is the operation of choice.

The safety and ease with which an ulcer of the duodenum may be excised depends entirely on the mobility of the duodenum. If the upper edge of the duodenum is bound down as a result of inflammatory adhesions following penetration of the ulcer, it is usually not advisable to attempt to excise the ulcer. As the surgeon's interest increases in these cases he gradually finds that a larger proportion can be excised than he formerly though was possible. At the present time I am excising the ulcer in about 50 per cent of the cases.

The immediate results are very satisfactory, and usually the patient has an easier convalescence than after any other type of operation on the stomach. The ultimate result is very good; in more than 90 per cent of cases there has been complete and permanent relief from all symptoms.

The mortality must be kept as low as that following gastro-enterostomy. This can be done by not attempting to excise the ulcer in the cases in which the duodenum is too fixed. There has been no mortality from technical failure, but as in other types of operation on the stomach pulmonary complications have occasionally been encountered.

Ulcers do not perforate after gastro-enterostomy, but a number of the bleeding ulcers continue to bleed at intervals, and therefore I consider the radical operation preferable in cases of duodenal ulcer in which severe bleeding has occurred. There has been a wave of enthusiasm over the radical operation for duodenal ulcer, and the reaction that was bound to come has already begun to show itself. While Mann has shown that a dog can live quite happily after his entire stomach has been removed, and furthermore, that a small stump of stomach left after resection has a marked tendency to enlarge, nevertheless, most persons are unwilling to consent to removal of the stomach to obtain relief from symptoms resulting from a duodenal ulcer.

GONOCOCCUS VACCINE

It is probable that gonococcus vaccine in some form or other is still used by physicians in the treatment of gonorrhea and its complications. There is no question, however, that this practice is far less extensive than formerly. The use of gonococcus vaccine for curative treatment appears to be sharing in the decline from popular favor of bacterial vaccines in general. Gonococcus serum and gonoccus vaccine were omitted from New and Non-official Remedies because the Council on Pharmacy and Chemistry concluded that there was no evidence to show that these preparations had therapeutic value. (Jour. A. M. A., April 3, 1926, p. 1091.)

KAOLIN IN INTESTINAL DISEASE

For centuries Chinese physicians have used kaolin in fevers and intestinal disorders, including cholera. Recent experiments seem to confirm the scientific basis of its use. Work in vitro has demonstrated that it is not an antiseptic agent but that in fluid mediums, if kept in motion, kaolin will carry down with it large numbers of bacteria. More than this, it combines with the toxic products of cholera, of the typhoid dysentery group of organisms, and, apparently, with putrefactive and proteolytic bacteria. Recent workers have successfully employed kaolin in Asiatic cholera, bacillary dysentery, chronic ulcerative colitis and acute enteritis. (Jour. A. M. A., April 17, 1926, p. 1217.)

OXYPERITONEUM*

R. L. Laney, M.D.†
Puposky, Minn.

The oxyperitoneum treatment of tuberculous enterocolitis consists of inflating the intraperitoneal space with oxygen.

The technic of this operation is very simple, being exactly the same as that used in the production of an ordinary artificial pneumoperitoneum for diagnostic purposes with the exception that oxygen is used instead of air.

It is unnecessary to previously prepare the patient by means of diet, enemata or laxatives. Almost any point on the anterior wall of the abdomen may be selected as a site for the operation. Dr. D. E. Holmdahl (Hygiea, Stockholm, Oct. 30, 1922) describes an improved technic for artificial pneumoperitoneum as follows: "The puncture is to be made in the left anterior axillary line, the patient lying on his right side, the shoulders raised a little. The needle is introduced just far enough down to escape the pleura, at about the eighth intercostal space. As the needle enters the abdominal cavity the manometer gives warning at once by the negative pressure."

However, my experience has led me to adopt a procedure almost exactly opposite to this. I have found it much better to select a location in the region of McBurney's point or in a corresponding region on the left side, for the reason that as soon as the oxygen finds its way beneath the diaphragm the patient will experience pains radiating to the shoulders, and the lower down the injection is made the more oxygen one can introduce before the patient complains of discomfort.

In females the abdominal puncture can be dispensed with by using the method of intrauterine abdominal inflation described by I. C. Rubin of New York in 1920. Rubin's method consists of introducing a metal catheter into the cervix and allowing the oxygen to flow through into the intraperitoneal space. In cases with closed tubes the oxygen will return alongside the catheter. After trying this method a few times I have abandoned it for the reason that all of the women on whom I have tried it complained of severe pain almost immediately after the oxygen started to flow. The pain, I think, was due to distention of the uterus and tubes, although it may have been due to the irritating action of the oxygen on the mucous membrane of the uterus and tubes, similar to or identical with the action of pure oxygen on the mucous membrane lining the trachea and lungs.

We usually do an oxyperitoneum with the patient in his regular bed, setting up the apparatus on a bedside table.

The instruments needed are a 10 c.c. glass hypodermic syringe with one very fine needle with which to anesthetize the skin and one larger needle with which to inject the deeper tissues, a very small knife and a pneumothorax needle connected by rubber tubing to a pneumothorax apparatus containing the oxygen.

The skin at the site of the operation is painted with either tincture of iodine or mercurochrome solution. The skin and all the tissues of the abdominal wall are anesthetized with a 0.5 per cent solution of novocain. The skin is then punctured with a small knife; the pneumothorax needle is then introduced into this puncture and pushed through the various tissues and into the intraperitoneal space. The oxygen is then permitted to flow until we think that the patient has all that he can retain without too much discomfort. In some cases this will be as little as two or three hundred c.c. and in others it will be as much as two or three thousand c.c. of oxygen. After the needle is withdrawn from the abdominal wall the puncture is sealed with a little cotton and collodion.

Of course, the technic must be varied at times to fit in with the various psychological and anatomical conditions of the patient. For instance, in some patients it requires considerable pressure to force the ordinary pneumothorax needle through the wall of the abdomen, and if these patients are unusually apprehensive it is better to use an extra long hypodermic needle of good-sized calibre when injecting the solution of novocain and to go right on through the peritoneum with it. The syringe can then be disconnected and the oxygen-carrying tube connected to the needle.

In extremely emaciated patients one should not attempt to make the puncture with the needle pointing directly to the patient's back because there is a possibility that the intestines may be pinned between the point of the needle and the posterior wall of the abdomen with no chance of escape. In such

*Read at the staff meeting of the Lymanhurst Hospital, Minneapolis, Dec. 15, 1925.

†Superintendent Lake Julia Sanatorium.

cases the needle should be pointed across the abdomen just before it goes through the peritoneum.

During the operation the intraperitoneal pressure may be determined by means of the manometer. As a rule we obtain a pressure of about plus 2 or plus 3 at the end of the injection, but we have produced pressures of plus 6 or plus 7. I do not think that it is advisable to produce a pressure higher than this for the reason that the patient may, even contrary to orders, attempt to get out of bed and thus produce a hernia where a "potential" one exists, or a certain rare complication may ensue such as has been reported in a patient following artificial pneumoperitoneum. In this particular case the patient raised erect and a sharp pain was felt in both sides of the neck which was followed by emphysema above the clavicles. Although very unusual, this is not serious.

One should not expect to obtain a reading of the pressure unless a needle of fairly large calibre is used, and the end of the needle is free in a pocket of oxygen.

The presence of oxygen in the abdomen can be determined for from ten days to two weeks, depending upon the amount injected. The presence of air in the abdomen has been reported three weeks after an injection of 2,000 c.c. (Dourre in Jour. de Radiologie et d'Electrologie, Paris, Aug., 1921). I believe that oxygen is absorbed much more quickly than air.

I know of no reason why the operation should not be repeated as often as is thought necessary, and I believe that to obtain the best results the injection should be repeated before all of the oxygen of the previous injection has been absorbed.

I do not know of any grave objections to this form of treatment, and, as yet, there has been only one objection suggested to me, and that was the possible danger of puncturing the intestines. Although I know of one case in which this accident happened, I think that it is little to be feared if the puncture is made in the manner I have outlined and if one is careful not to select patients who are very tympanitic from the presence of gas in the intestines. The many hundreds of times that the operation of producing artificial pneumoperitoneum for diagnostic purposes has been performed, with practically no deaths reported, would seem to speak well for the safety of the procedure. Besides the case which I have just mentioned in which the intestines were punctured, I have seen but one report of a death following the production of an artificial pneumoperitoneum. This case was reported by Dr. Benjamin S. Barringer of New York (Jour. Am. Med. Assn., Sept. 24, 1921). The patient, who had carcinoma, died some days after the inflation of the peritoneum. At the autopsy the patient was shown to have a generalized peritonitis. It was presumed that this patient was unusually susceptible to infection because of the advanced carcinoma.

None of our patients have had any unpleasant experiences during or after the inflations with the exception of the shoulder-pains previously mentioned, and discomfort on coughing in those cases in which an unusually high intraperitoneal pressure was produced.

For a day or two after the inflations some of our patients have noted a peculiar sensation in the abdomen when turning from one side to the other. This was caused, no doubt, by the intestines dropping to the lower side of the abdomen without the usual support of the abdominal wall.

The greatest advantage of this form of treatment for intestinal tuberculosis is that of immediate results. A very definite relief is usually obtained in from one to two days, whereas in other forms of treatment it is generally a matter of weeks or months before relief is experienced.

Of course, it is not quite so simple to do an oxyperitoneum as it is to prescribe a diet, give an intravenous injection of calcium chloride solution, or to prescribe heliotherapy, but the quick relief that is given to most of the patients is reward enough for what little effort the operation requires.

After more than three years' use of oxyperitoneum for the relief of distressing symptoms accompanying intestinal tuberculosis, I am of the opinion that it is one of the most useful procedures at our command.

We have had cases in which the oxygen was not successful in relieving the diarrhea nor the pain to any great extent, and in some of our most successful cases not every injection was followed by as much relief as we had hoped for, but in over 60 per cent of the patients treated, the relief experienced was very pronounced, and in some cases it was almost magical.

As we all know, the symptoms of intestinal tuberculosis may range from practically none at all, up to the most painful and distressing, and that sometimes the symptoms are in inverse ratio to

the amount of pathological involvement present. For this reason we have not been able to definitely decide as to the stage of the disease in all of the patients we have treated. Up to the present time our work with oxyperitoneum has been confined almost entirely to those cases with the more urgent symptoms, so that I am unable to report anything of value on the use of oxygen in the, presumably, early cases of intestinal tuberculosis.

Lately, since I have become more sure of the value of oxyperitoneum, I am using it in cases having the early or more mild symptoms, such as loss of appetite when combined with nausea, feeling of fullness, or colicky pains, with or without diarrhea.

The results we usually get from oxyperitoneum are relief of pain, nausea and vomiting, reduction in the number of bowel movements and increase in appetite.

As yet, I am unable to come to a definite opinion as to just why an oxyperitoneum is of such benefit to the patient. I rather think that the favorable results are derived from both the increased intra-abdominal pressure and from a direct chemical action of the oxygen.

Beneficial results are not always obtained in the same patient unless a fairly good supply of oxygen is injected into the intraperitoneal space; other parts of the body will not do. By way of proving this fact and at the same time testing for the presence or absence of a psychological effect of the operation, I have injected from 150 to 200 c.c. of oxygen into the peritoneal space, then, partially withdrawing the needle, have injected another 400 or 500 c.c. into the subcutaneous tissues of the abdominal wall to give the abdomen the usual appearance and sensation of fullness to which the patient has been accustomed; then, opening the by-pass in the needle, another 1,000 c.c. of oxygen has been allowed to flow into the air. The patient, watching the pneumothorax apparatus, is under the impression that he has received a good dose. Each time that I have tried out this experiment the patient has complained that the oxygen did not seem to "work so well."

It seems no more than reasonable to think that at least some of the beneficial effect of the treatment is due to a chemical action of the oxygen itself, because this element plays such a major part in the maintenance of all organic life.

James Todd, of Pittsburgh, who has been conducting very extensive experiments with oxygen on diseased animals for the past eight or nine years, says, "Oxygen enters into our bodies at both points of ingress, the stomach and the lungs, and it is of great significance that we find that nature chooses it as the only element to thus doubly enter our bodies. It is a fact of very great significance that nature, after she has expended the power of the elements derived from our food in maintaining our bodies, eliminates them always in combination with oxygen. The carbon comes out through our skin and our lungs as CO_2, the hydrogen as H_2O. Both elements are not only in combination with oxygen but are fully oxidized and are each held separately, as it were, in the grasp of their custodian, oxygen."

After reading Todd's report on his experiments with the effects of oxygen on guinea pigs that have been inoculated with tubercle bacilli, one cannot fail to be convinced that oxygen does vastly increase the disease-resisting powers of the body.

Patients sometimes say that they can feel their appetite increase almost immediately after the injection of oxygen. I believe that this increase in appetite is brought about in the same way that it is brought about by a ride of a few hours out of doors in the fresh air. That is, there is an increased supply of oxygen taken up in the blood and made available for the various functions of the body in which oxygen is needed.

No doubt, while the oxygen is fresh and under considerable pressure in the abdomen, much of it finds its way into the oxygen-carrying system of the body, and among other cells and organs benefited by it are the oxyntic glands, which are the acid-secreting glands of the stomach.

To support my opinion I will quote from Cohnheim, who says, "In muscular work which passes beyond the physiological limits and demands a greater supply of oxygen than is furnished, there is formed lactic acid and it seems that the resulting fatigue is due to the formation of organic acids. In the stomach hydrochloric acid is formed from the neutral blood from which it draws neutral acid ions, and this process tends to move the equilibrium toward the alkaline side. For this reason gastric secretion may be preventive of fatigue or the feeling of fatigue."

One of the products of combustion in the body is CO_2 and if sufficient oxygen is not at hand to complete the process, lactic acid is formed instead.

Lactic acid is an intermediate product of combustion when CO_2 is produced. Not only must there be a sufficient supply of oxygen on hand to complete the process of oxidation, but also a good supply of carbon, which is furnished by food—chiefly carbohydrates.

The above facts being true, it would seem likely that the feeling of increased strength that some patients experience after an oxyperitoneum may be due to the direct absorption of oxygen in sufficient quantities to prevent, to a certain degree, the formation of lactic acid, which acid would supposedly be present as a result of decreased oxygenation due to impaired function of the lungs and circulatory system. It would also seem likely that the patient's increased appetite may be a sort of by-product of this beneficent process, due to the increased amount of oxygen made available in the blood for the use of the oxyntic cells in their process of secreting the acid of the gastric juice.

Whatever the process may be, the improvement of symptoms is so great in a large proportion of the patients treated, that oxyperitoneum is well worth trying in all cases of intestinal tuberculosis with distressing symptoms.

TUBERCULENE, A FRAUDULENT CONSUMPTION CURE

Tuberculene has been exploited from Danville, Ill., by one Mrs. D. J. Murrmann, under the trade name Tuberculene Mfg. Co., as a "lung restorer." A fraud order has been issued against the Tuberculene Mfg. Co. debarring it from the mails. Tuberculene was a mixture of creosote, rock candy syrup, glycerin, syrup of wild cherry and coloring matter. In the trial, the government pointed out that creosote preparations had long been used in the treatment of certain symptoms in cases of pulmonary tuberculosis, but that it has been definitely established that they do not destroy the tubercle bacilli. (Jour. A. M. A., Apr. 3, 1926, p. 1089.)

BISMUTHAL OMITTED FROM N.N.R.

Bismuthal (Langley & Michaels Co., San Francisco) is a mixture containing an insoluble bismuth citrate and pepsin as its active ingredients, with hydrochloric acid and lactic acid to protect the pepsin. It was accepted for New and Non-official Remedies in 1909, when an extended clinical practice of prescribing mixtures of a bismuth preparation and pepsin justified its acceptance. During recent years, the prescribing of pepsin in combination with other therapeutic agents has been generally abandoned. The Council omitted Bismuthal from New and Non-official Remedies on the ground that the routine combination of a bismuth compound and pepsin in the form of a stock preparation is not in the interest of rational therapy. (Jour. A. M. A., April 17, 1926, p. 1233.)

MASSIVE COLLAPSE OF THE LUNG*

LEO G. RIGLER, M.D.
Minneapolis

Massive collapse of the lung is a shrunken, airless condition of a part or all of one or both lungs, occurring suddenly after operation or injury below the neck, without the direct application of external force, or demonstrable obstruction of the air passages. Essentially, it is the same as pulmonary atelectasis, which has been well recognized, both pathologically and clinically, for many years. It differs only in that its onset is abrupt, that it usually is lobar in distribution, and that it is intimately associated with some form of trauma.

In 1908, W. Pasteur[1] first called attention to atelectasis of the lungs following abdominal operations, although he had observed in 1890 a similar condition in cases of post-diphtheritic paralysis of the diaphragm. He noted collapse of the lungs at autopsy in cases of peritonitis with abdominal operations. By careful examination, he was soon able to demonstrate this phenomenon, clinically, in a large number of post-operative cases, and he described it as a frequent post-operative pulmonary complication. A similar case had already been reported by Barr[2] in 1907. In 1914, Elliott and Dingley[3] reported a group of similar cases and discussed the etiology in detail. During the war, a similar pulmonary accident was observed by Bradford[4] and others. They noted the development of the physical signs of effusion following bullet wounds of the chest. Paracentesis was done, but, contrary to expectations, no blood or other fluid could be recovered. They soon discovered cases in which the physical signs appeared on the side opposite to the wound; often the same signs were present when there was no penetration of the chest wall by the missile. They then observed a displacement of the mediastinum toward the side of the lesion, rather than away from it, as should occur in hemothorax; the diaphragm seemed to be displaced upward rather than downward, as in pleural effusions. They concluded that they were dealing with massive collapse and thus added a group of post-traumatic cases to the post-operative

*From the Department of Roentgenology of the Minneapolis General Hospital. Presented before the Minnesota Pathological Society, Jan. 19, 1926.

cases previously reported. Post-mortem studies in some of these cases confirmed their findings.

The first case reports in this country were made by Scrimger[5] in 1921. Since then there have been numerous reports from different clinics, notably by Hirschboeck,[6] Scott,[7], Jackson and Lee,[8] and Churchill.[9] The literature is so completely reviewed in the last three papers that it need not be further dealt with here. In spite of these contributions, the etiology is still obscure, the pathology is not yet well understood, and this entity is entirely unknown to many competent surgeons and clinicians.

Pasteur[1] thought the collapse of the lung was due to paralysis or at least immobility of the diaphragm. Elliott and Dingley[3] put forth the theory that it was due to bronchial obstruction. A complete review of the various theories and the experimental work is given by both Jackson and Lee,[6] and Churchill.[9] It would appear that the most reasonable explanation is that elaborated by the former: that it is due to a combination of respiratory immobility and bronchial obstruction, the latter being the result of the former. The restriction of respiration and diaphragmatic movement which follows an abdominal operation causes an accumulation of bronchial secretions which dry and form a plug. The latter acts as an obstructive foreign body which, in the presence of an intact circulation, will cause atelectasis. The close resemblance of massive collapse, both clinically and pathologically, to the atelectasis which follows complete bronchial obstruction by a foreign body, serves to support this theory. In addition, Jackson and Lee cite a case in which bronchoscopy was done and a plug removed with subsequent clearing of the collapsed lung.

Bradford's description[4] of the pathology is comprehensive. Grossly the lung is shrunken, heavy, does not crepitate, appears congested, is airless. There may be fluid in the bronchi. On microscopic examination the alveolar walls are collapsed against each other, the alveoli being obliterated. There is no exudate, no invasion of leucocytes, simply shrunken lung tissue. It is apparent that the ingress of air has been interfered with; the circulation remaining intact, the air is absorbed by the blood and the lung gradually shrinks down; as a result of the decreased intrathoracic pressure, the diaphragm on the affected side moves upward, the mediastinum moves toward the affected side. The opposite lung becomes emphysematous and tends to push the mediastinum more toward the affected side.

The condition occurs most frequently following abdominal operations. It may occur after operation or injury to the body anywhere except in the head, neck, or upper extremity. The onset usually occurs in twenty-four to seventy-two hours after the trauma, and may be sudden with pain, dyspnea, tachycardia, cyanosis, and fever. In these fulminating cases, it closely resembles pulmonary embolism. Most often, the onset is slow and the dyspnea and cyanosis are the most prominent findings. Fever of rather low grade is always present and there may be leucocytosis. The patient rarely looks very toxic and may consider himself well. In a small percentage of cases, there are no symptoms, the abnormal condition being discovered on routine physical examination. Expectoration may occur but it is usually late and it has been noted that recovery may commence shortly after the bringing up of large quantities of muco-purulent sputum. The clinical course is most frequently mild, lasting three to six days, the temperature not going above 102° F., and terminating by lysis. In some cases the temperature is present for only a few hours and the findings clear up with great rapidity. A few cases have been reported in which alternating collapse and expansion occurred over a period of weeks, the whole course lasting several months. It is notable that no case of unilateral collapse without complications has ever proved fatal.

Pneumonia may be a complication as shown by the appearance of rusty sputum, higher temperature, toxicity of the patient, and a distinct change in the clinical course. Pleural effusion has also been reported as a complication, but it is probable that there was a preceding pneumonia in these cases.

The physical signs usually suggest pleural effusion or early pneumonia; cyanosis is prominent; asymmetry of the chest with flattening and immobility of the affected side may be observed. There is marked dullness on the side of the lesion, tympany on the opposite side. The breath sounds are usually suppressed, but may be bronchial at times. Bronchial râles may occur late in the course of the disease. If the left lung is affected, the high diaphragm may be detected. If it is on the right

side, the displacement of the heart and trachea to the right can be made out.

Pneumonia is the most frequent clinical diagnosis in the presence of massive collapse. The differential factors are the lower temperature, more marked cyanosis, atypical physical signs, lack of toxicity of the patient, and the displacement of the mediastinum. Pleural effusion is differentiated chiefly by the fact that the heart and trachea are displaced toward the side of the lesion rather than away from it; the diaphragm moves upward instead of downward. Pulmonary embolism, acute lung abscess, dextrocardia, acute dilatation of the heart, and pneumothorax on the opposite side, are frequent mistaken diagnoses; their differentiation is obvious.

The best diagnostic method is the roentgen examination. The diagnosis may be made by this means alone, as will be shown in the cases reported here, or it can be definitely confirmed in this way, when suspected clinically. The physical examination of post-operative patients is beset with difficulty. Movement is painful; frequently the posterior chest cannot be examined at all; the position of the patient may make asymmetry and immobility of the chest, movement of the diaphragms, and displacement of the mediastinum impossible to demonstrate. The roentgen examination with a bedside machine is a simple procedure, as we have demonstrated in a very large series of acute lung conditions at the Minneapolis General Hospital. There is much less disturbance to the patient in taking a film in this way than on a physical examination, and the results are usually clear-cut and diagnostic.

The chief *x*-ray findings in post-operative massive collapse have already been described by Holmes.[10] There is opacity of more or less degree obliterating a lobe or a whole lung, frequently of rather mottled character. The diaphragm on the affected side, if it can be distinguished from the shadow of the lung, will appear high. The heart and trachea can easily be distinguished and are displaced toward the side of the lesion. The latter is by far the most important finding, as it serves to differentiate all the acute conditions with which this entity may be confused. It should be emphasized that the only acute condition, in which there is immediate movement of the mediastinum toward the side of the lesion, is complete bronchial obstruction, by a foreign body. This can usually be ruled out with ease. Chronic lung fibrosis or chronic fibroid tuberculosis may produce a somewhat similar roentgenogram, but the

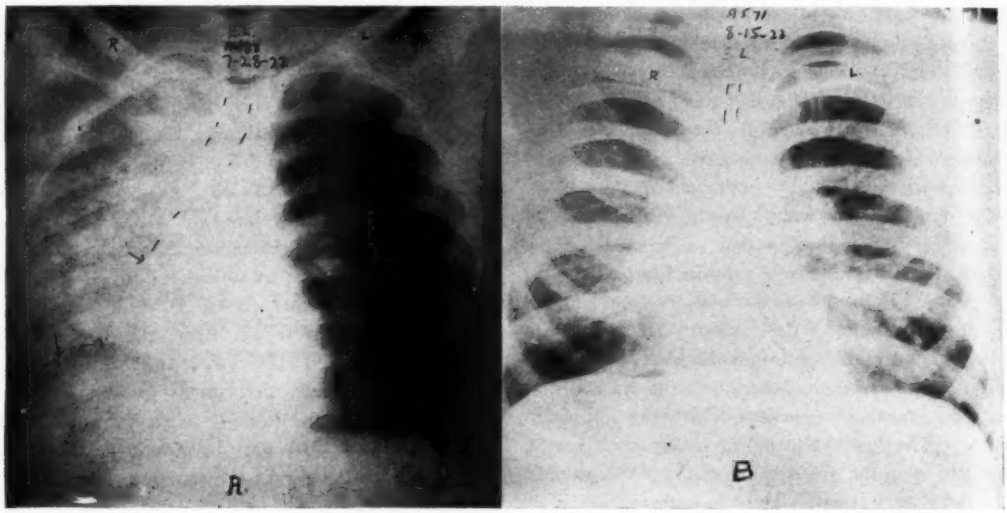

Fig. 1, Case 1.

A. Roentgenogram taken seventh day after onset. The mottling of the right lung, the high right diaphragm, and the displacement of the heart and trachea to the right should be noted. The arrows indicate the right diaphragm and the right border of the heart.

B. The appearance before discharge. Note the clear right lung and the normal position of the mediastinum.

condition is obviously not acute and the displacement of the mediastinum is permanent. Repeated *x*-ray examination in massive collapse will demonstrate the gradual replacement of the mediastinum to its normal position, indicating the temporary character of the movement. By the roentgen method, the clearing of the collapsed lung may be beautifully demonstrated on repeated examination; a clear concept of the changes taking place may be obtained.

Two cases of massive collapse of the lung following operation and trauma have occurred at the General Hospital in the past six months. We have been able to diagnose both of these roentgenologically. Since the observation of these two cases, we have examined the records at the hospital for the past few years to determine whether any cases have occurred which may have been overlooked. For the purposes of this study an adequate *x*-ray examination has been used as a criterion in the selection of cases. In order that the roentgen examination should be considered adequate, at least one film must be obtained during the course of the disease and at least one must be obtained either before the onset or after the disappearance of the symptoms. The object of the latter is to rule out the possibility that the displacement of the mediastinum was due to some previous condition. In view of the fact that collapse is said to be associated with lobar pneumonia, these cases were also reviewed. We have found 285 cases of ordinary pneumonia, without any previous history of trauma, which have been adequately studied with the *x*-ray. In this group there were two cases, or less than 1 per cent, in which collapse of the lung could be demonstrated. There were forty-eight cases of post-traumatic or post-operative pulmonary complications which had been adequately studied with the *x*-ray. In this group were found eight cases of undoubted massive collapse or approximately 16 per cent. These, together with one other, are reported here.

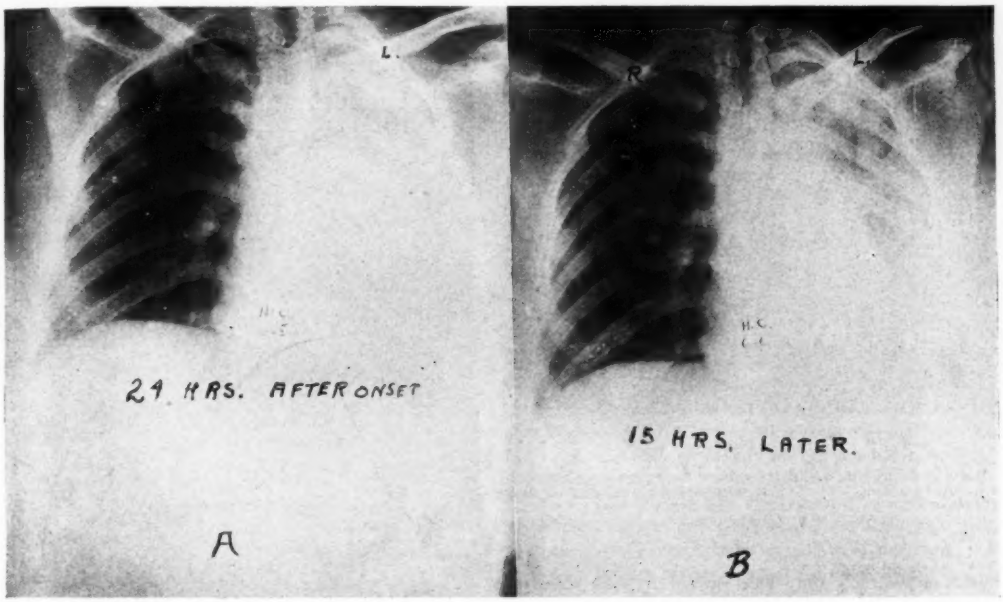

Fig. 2, Case 2.

A. Roentgenogram taken twenty-four hours after onset showing the marked opacity of the left lung and the displacement of the heart to the left.
B. Appearance fifteen hours later. Note the marked clearing that has taken place and the displaced heart.

The cases divide themselves into four groups. The first is composed of three cases which are typical of simple post-operative massive collapse without complications and illustrate the clinical and roentgenographic signs which have been previously described.

Case 1. E. L., a white male, eighteen years of age, was operated under ether anesthesia and an acute suppurative

appendix was removed. The post-operative course was normal until forty-eight hours, when the temperature rose to 102° F. Twelve hours later there was dyspnea, cyanosis, and slight cough. The clinical diagnosis was post-operative pneumonia. Two days later the physical signs suggested

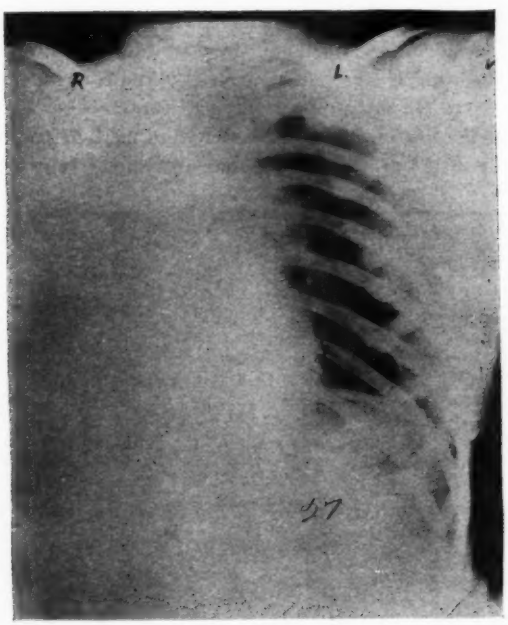

Fig. 3, Case 4.

Roentgenogram taken two days after onset showing the marked opacity of the whole right lung and the displacement of the heart to the right. The left border is just visible beyond the spine and is indicated by the arrow.

effusion on the right side. Paracentesis was done repeatedly without result. The first roentgenogram was made four days after the onset and showed almost complete opacity of the whole right hemithorax. The heart and trachea were markedly displaced to the right and the right diaphragm could be just made out at the fourth rib anterior. The symptoms and signs continued for eight days, when improvement began. The temperature was never above 102.6° F. and cyanosis was marked throughout. Bronchial râles only could be heard; there was marked dullness with suppression of breathing. The patient was not toxic and not even uncomfortable. The second roentgenogram (Fig. 1 A), taken on the seventh day after the onset, shows clearly the marked displacement of the mediastinum toward the right side, the high right diaphragm, and the mottling of the lung field which was still present. The patient recovered completely and was discharged two weeks later. Fig. 1 B shows the appearance before discharge, the lung fields, mediastinum, and diaphragms being entirely normal.

Case 2. This followed cholecystectomy under local anesthesia. The onset occurred in sixty hours, cyanosis was prominent, there was marked immobility of the left chest, the temperature did not go above 103° F., and the symptoms only lasted four days. The clinical diagnosis was post-operative pneumonia. The first roentgenogram (Fig. 2 A) was taken 24 hours after the onset and the diagnosis was made at this time. The marked opacity of the entire left lung and the displacement of the mediastinum to the left is well shown. A second film (Fig. 2 B) was made fifteen hours later and demonstrates the extremely rapid clearing of the lung and the displacement of the heart, which was still present.

Case 3. This was in a child of ten years and followed appendectomy. The clinical course was somewhat prolonged but otherwise the clinical and roentgenographic signs were the same as those described above. There was also complete recovery.

These three cases illustrate well the salient facts in uncomplicated, unilateral, post-operative massive collapse. In one case there was local anesthe-

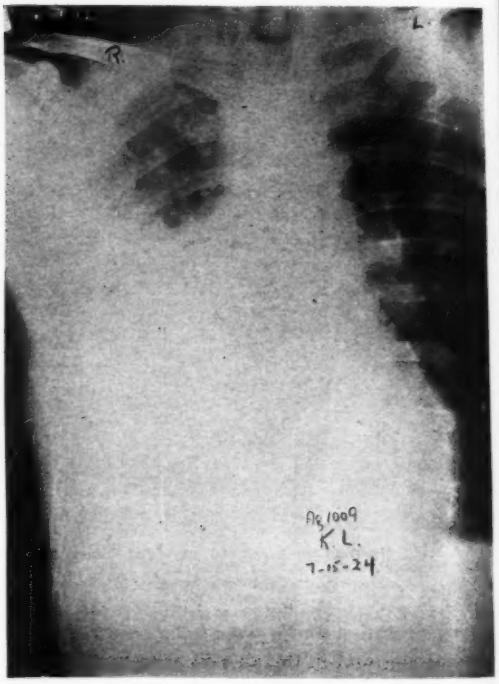

Fig. 4, Case 6.

Roentgenogram taken twenty-four hours after onset showing the marked opacity in the lower right lung and the displacement of the heart to the right.

sia used and all were abdominal operations. The onset was sudden, the symptoms mild, the physical signs indicated fluid, cyanosis was prominent, the temperature was low, toxicity was not marked, the course was fairly short and mild. The typical *x*-ray findings of opacity and displacement of the mediastinum toward the side of the lesion were

present in all three cases. The rapid clearing of the lung in Case 2 was notable.

The second group consists of two cases illustrating complications in post-operative massive collapse.

Case 4. V. S., a white female, had a bilateral salpingectomy under ether anesthesia. One day later the temperature rose to 100.2° F. and a cough developed. The next day the respiratory symptoms became more pronounced, the temperature rose higher, and marked cyanosis developed. There were signs of consolidation throughout the right lung. Figure 3 indicates the roentgen appearance at that time; the whole right lung was opaque, the mediastinum displaced markedly to that side. The temperature later rose, reaching 104.2° F., and leucocyte count became 15,500. The symptoms continued until eleven days after operation, when a crisis took place, following which the roentgenogram showed resolution with retraction of the heart still present. There was improvement for two days; the lung appeared to clear; the next film showed the heart in normal position. Symptoms and signs of empyema then appeared and were confirmed by *x*-ray examination, which now showed the heart displaced to the left. Thoracotomy

Fig. 5, Case 8.

Roentgenogram taken twenty-four hours after onset. Note the partial opacity of the whole right lung, the upward displacement of the diaphragm and the displacement of the heart to the right.

was performed, pus obtained, but there was no relief and the patient died.

The mildness of onset, the marked displacement of the mediastinum toward the side of the lesion, the marked cyanosis, and low temperature indicate a massive collapse at the beginning. The onset of toxicity and high temperature, the typical crisis at the end, and the appearance of empyema later, all indicate a superimposed pneumonia. The mobility of the mediastinum and its response to changes in intrathoracic pressure was well shown by the movement from extreme right displacement to extreme left displacement as the collapse disappeared and pleural effusion appeared.

Case 5. This also followed bilateral salpingectomy. The onset and clinical course were typical of massive collapse until the third day after the onset, when rusty sputum appeared and distinct signs of consolidation of the right upper lobe were found. *X*-ray examination the next day showed a typical right upper lobar pneumonia. In addition, there was some mottling of the middle and lower lobes, a very high right diaphragm, and marked displacement of the mediastinum to the right.

The rusty sputum, physical and *x*-ray findings indicate that pneumonia appeared superimposed upon an ordinary case of collapse.

The third group comprises three cases illustrating post-traumatic massive collapse. These are usually diagnosed pneumonia, although the rapid appearance of the symptoms after the accident has been a puzzling factor. They resemble closely the bullet wound cases reported by Bradford and others. Very little attention has been paid to this group, although they are no doubt of considerable importance even in civil practice.

Case 6. K. L., a white male, was admitted twelve hours after sustaining a fracture of the pelvis. He had been perfectly well before this injury, but on admission he had a cough, expectoration, a temperature of 102° F., marked cyanosis, and dullness and absence of breathing over the right lung. Figure 4 represents the roentgenogram taken the next day. There is marked opacity of the whole right lung with definite displacement of the heart toward it. The temperature never rose above 102.6° F. and the leucocyte count was 9,900. In six days the temperature was normal and the patient began to expectorate large quantities of mucoid sputum. A roentgenogram before discharge showed the mediastinum in normal position.

Case 7. This also followed a fracture of the pelvis. The patient was admitted immediately and had no symptoms or signs of a pulmonary condition. The typical symptoms and signs appeared within twelve hours and lasted only three days. The roentgenographic signs were characteristic.

Case 8. From the Northern Pacific Hospital. This patient sustained a fracture of the spine and of the right ribs. On admission there were no respiratory signs or symptoms. These developed as in the above cases. Owing to the known rib fracture and the physical signs it was thought that there was a hemothorax. The roentgenographic findings (Fig. 5) were typical of massive collapse, however, and the pulmonary condition disappeared in a short time without interference. This case was diagnosed roentgenologically by Dr. Walter H. Ude.

All these cases had a sudden onset of respiratory symptoms and signs shortly after severe injury.

These were accompanied by low temperature and the cases ran a typical, mild, short course. The roentgenograms demonstrate the displacement of the mediastinum toward the side of the lesion, indicating the presence of massive collapse of the lung. The last case resembles very closely the war wound cases of Bradford, in which hemothorax was also thought to be present because the trauma was to the chest wall.

The final case illustrates a group in which alternate collapse and clearing occurs and the symptoms and signs persist for a long period of time with eventual recovery.

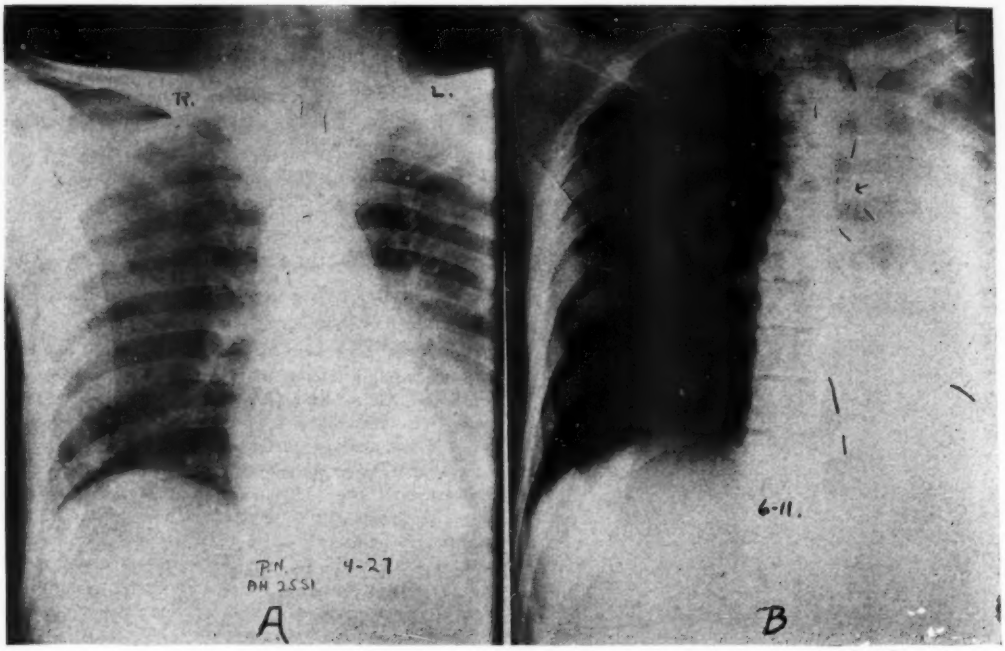

Fig. 6, Case 9.

A. Roentgenogram taken shortly after the onset of symptoms. Note the shadow in the left lower lobe and the normal position of the mediastinum.
B. The appearance six weeks later. Note the marked opacity of the whole left side, the extreme displacement of the heart and trachea to the left, the high diaphragm. The right border of the heart is indicated by lines, the diaphragm and trachea by arrows.
Eventually the appearance of this chest became entirely normal.

Case 9. P. N., a white male, was admitted suffering from a bullet wound in the abdomen. The bullet was removed and five days later he developed severe respiratory symptoms. The *x*-ray examination at that time (Fig. 6 A) revealed the heart in normal position, but there was a shadow in the left lower lobe thought to be pneumonia. A week later the patient had apparently recovered, but the roentgenogram at that time showed displacement of the mediastinum to the left with some mottling of the lung. He left the hospital at this time and was not well for about a month, when he returned showing extreme dyspnea, tachypnea, tachycardia, cyanosis, aphonia, and a temperature of 99.2° F. The *x*-ray film at this time showed a diffuse, mottled, dense shadow throughout the left lung with displacement of the mediastinum to the left. A week later (Fig. 6 B) the whole left lung was markedly opaque and there was such marked displacement of the heart and trachea to the left that a clinical diagnosis of pneumothorax on the right side was considered. The temperature was never above 101° F. A week later there was some clearing again and about this time the patient began to bring up copious quantities of thick mucoid sputum. Recovery followed this rapidly. He was finally discharged as recovered three months after the onset. The last roentgenogram showed the lung clear and the mediastinum in normal position.

The long duration, the alternate collapse and clearing of the lung, and the extreme displacement of the heart and trachea to the left, were the interesting features in this case. The aphonia was thought to be associated with the extreme deviation of the mediastinum, possibly from pressure, as it disappeared when the patient recovered from the pulmonary condition.

Thanks are due to Dr. Walter H. Ude for assis-

tance in the study of these cases and for the privilege of reporting Case 8.

SUMMARY

1. Massive collapse of the lung is a clinical and pathological entity, identical with pulmonary atelectasis, and frequently follows trauma below the neck.

2. The symptoms and signs resemble pneumonia except that the course is more mild, there is less toxicity, and cyanosis is more prominent. The most important finding is the displacement of the mediastinum toward the side of the lesion and the upward movement of the diaphragm on the same side.

3. The roentgenogram affords the best method of diagnosis. There is marked opacity or mottling of the affected lung. The high diaphragm and displaced mediastinum can best be made out in this way.

4. Nine cases are reported which divide themselves into four groups as follows:

(1) Uncomplicated, unilateral, post-operative massive collapse following cholecystectomy under local anesthesia in one case, and appendectomy in two cases. These present the typical symptoms, physical signs, and roentgenologic findings.

(2) Two cases of post-operative massive collapse complicated by pneumonia, in one of which empyema also developed.

(3) Three cases of post-traumatic massive collapse, two following fractures of the pelvis, and one following fracture of the spine and ribs. These cases are probably more frequent in civil practice than has been believed.

(4) One case of alternate collapse and clearing extending over a long period of time with eventual recovery. This was also post-traumatic.

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REST IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

F. F. CALLAHAN, M.D.
Pokegama, Minnesota

In the treatment of tuberculosis, especially the pulmonary lesions, we obtain our results very slowly. Yet good results can be obtained in a large percentage of reasonably early cases if physician and patient will take the necessary time. At the beginning of treatment it is also very important to recognize the fact that an individual once afflicted with an open active pulmonary tuberculosis must live a restricted life for years after all symptoms of activity have disappeared, if relapses are to be avoided. However, the purpose of this paper is mainly to point out the safest road for the patient who is combating an active tuberculosis.

Of all the remedies that have been current in the treatment of this disease, rest is the only one that has been applicable in all active cases, and today it is recognized by experienced phthisiologists as the sheet anchor in treatment. Climate, forced-feeding, pine trees, etc., have had their day, but in the absence of physiologic rest they have been found hopelessly inadquate. Every year we hear of a new specific for tuberculosis, and after a few months these are found useless or only helpful in a limited number of the most favorable types of cases. Drugs are useful and often necessary in treating certain symptoms, but they certainly have no effect in checking or limiting the disease. In our opinion there are two essential adjuncts to a successful rest cure: fresh air and good, wholesome food.

Strange as it may seem, rest in the treatment of this disease has been seriously tried only during the past decade. We believe that we are getting better and more permanent results by giving patients a long period of rest when they first come under observation. Since the advent and general use of serial roentgenography by Amberson and others, in following the course of tuberculous individuals under treatment, we have found that many serious lesions clear up entirely or are greatly diminished in size by a few months of rest in bed. The cases that show complete or almost complete resolution are generally the more acute ones whose onsets

*Read before the Ramsey County Medical Society, St. Paul, 1926.

Fig. 1a. W. Z., Aug. 23, 1923. Showing infiltration in left upper lobe, slight fibrosis of the right apex.

Fig. 1b. W. Z., Sept. 3, 1924. Showing marked clearing in left upper lobe with evidence of thickened pleura and a small amount of fluid in left lower.

Fig. 2a. Miss E. R., Sept. 9, 1923. Showing extensive infiltration of the left lung, with a very good right lung.

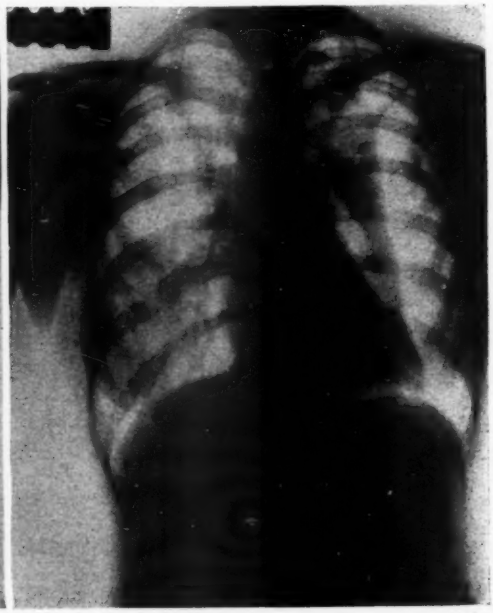

Fig. 2b. Miss E. R., July 14, 1924. Showing extension of disease to the right lung, left lung half compressed with an adhesion preventing a complete collapse of the upper lobe.

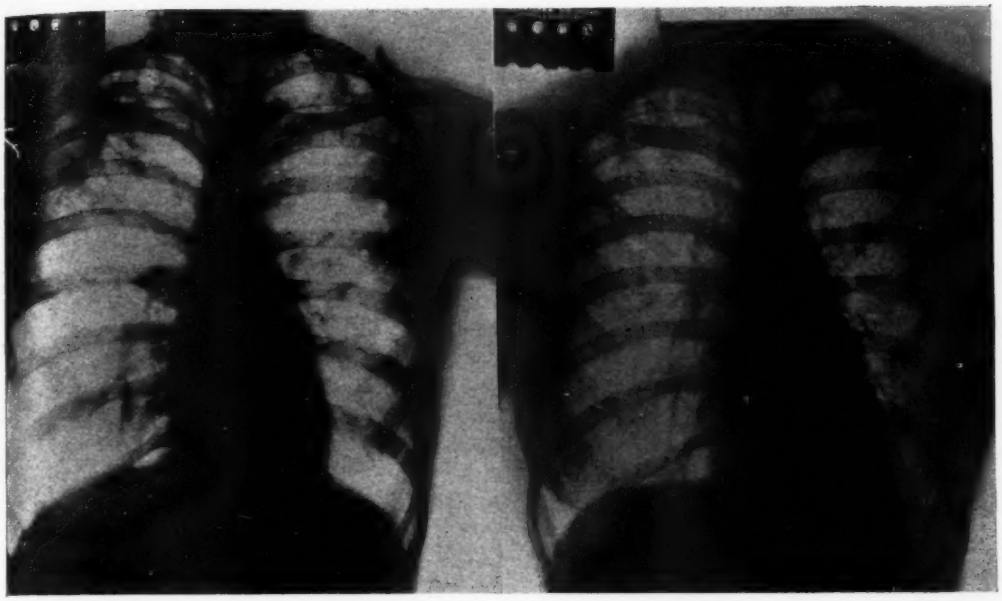

Fig. 3a. Miss F. A., July 22, 1922. Evidence of involvement in both upper lobes.

Fig. 3b. Miss F. A., April 10, 1924. After a large left-sided pleural effusion, which was not aspirated. Both upper lobes show remarkable clearing. There is an obliteration of the left costo-phrenic angle.

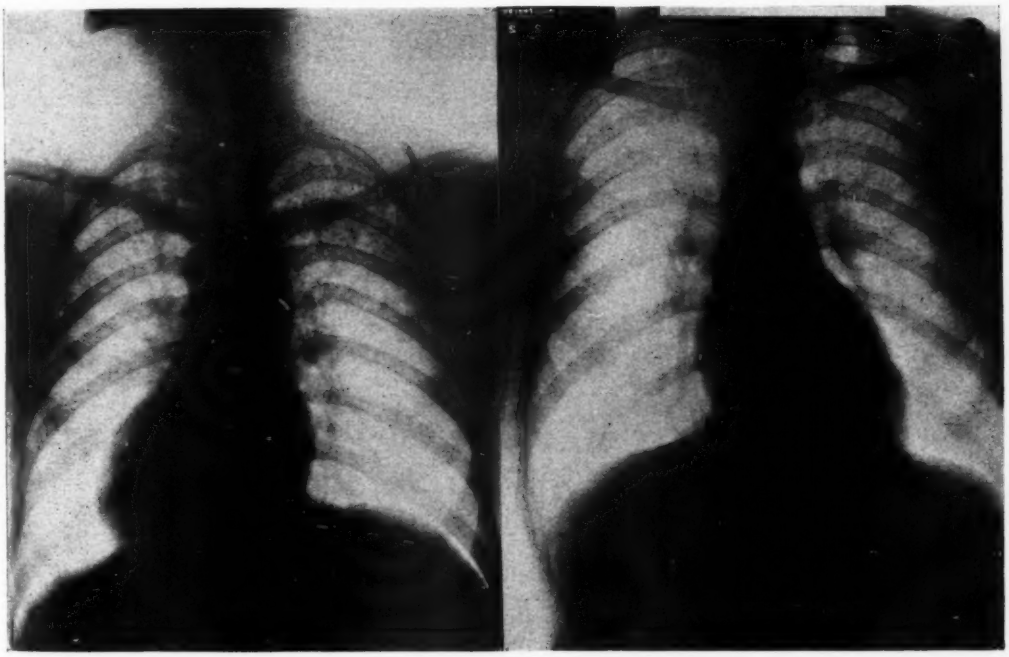

Fig. 4a. Mr. P. D., April 5, 1923. Showing extensive infiltration in both upper lobes.

Fig. 4b. Mr. P. D., July 5, 1924. Showing almost a complete resolution in the upper lobes of both lungs.

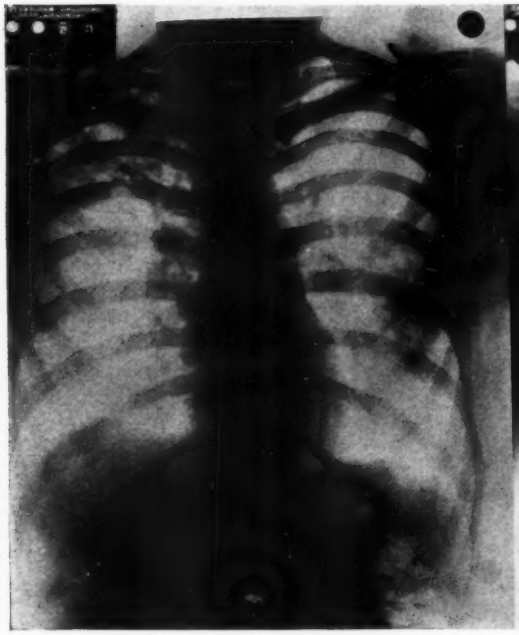

Fig. 5a. Mr. S. H., Sept. 21, 1922. Showing dense infiltration in the right upper lobe, with extensive infiltration in the middle of the left lung.

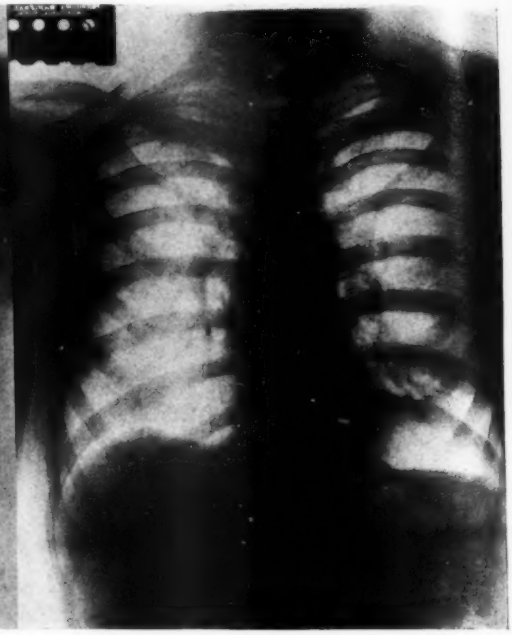

Fig. 5b. Mr. S. H., Aug. 25, 1924. After the absorption of a large left-side pleural effusion. Shows a disappearance of a left-sided lesion and a fibrosis of the right apex.

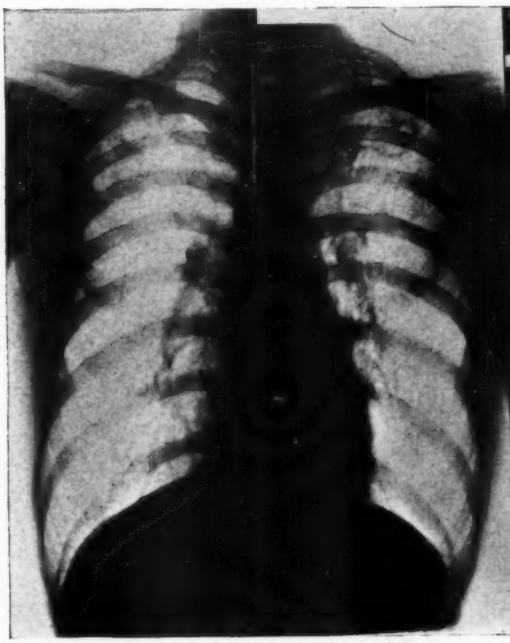

Fig. 6a. R. K., July 17, 1922. Showing infiltration and fibrosis in both upper lobes, with a probable cavity in the left upper.

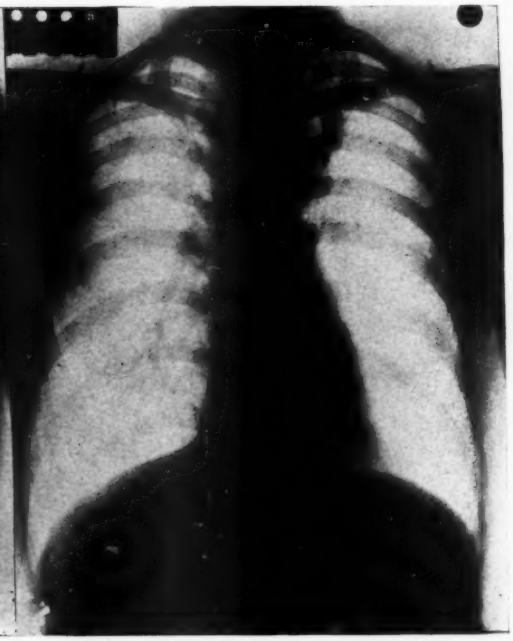

Fig. 6b. R. K., June 27, 1923. Shows clearing in both upper lobes, with evidence of marked fibrosis in the left upper.

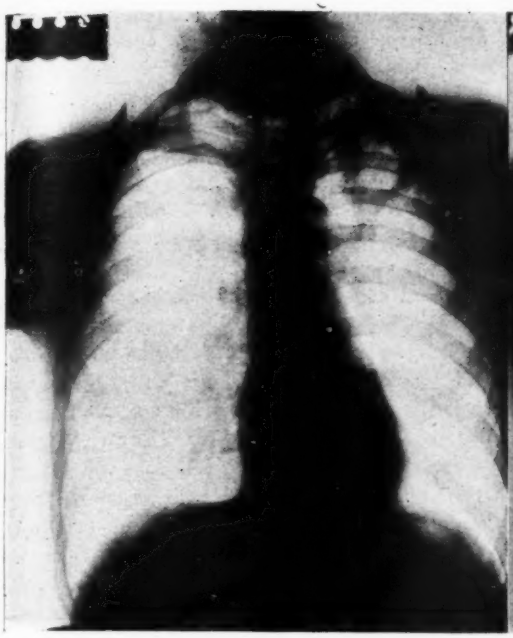

Fig. 7a. A. F., Nov. 12, 1925. Showing rather marked involvement in the left upper lobe, with probable cavity formation. History of two years' standing.

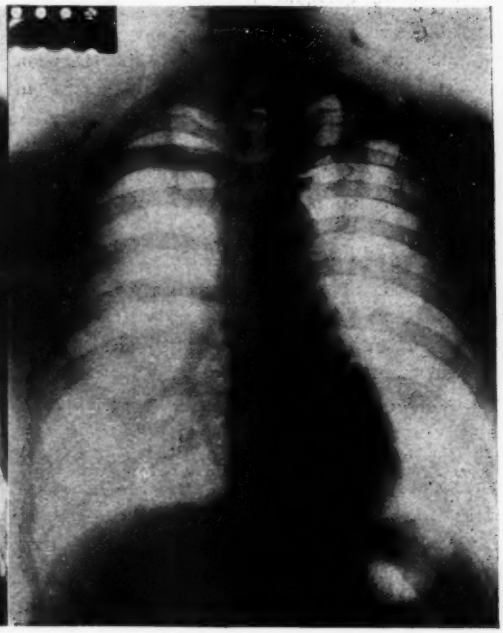

Fig. 7b. Feb. 5, 1926. After 12 weeks' rest in bed, there is a complete disappearance of the annular shadow or cavity in the first picture, and the lesion is very much smaller.

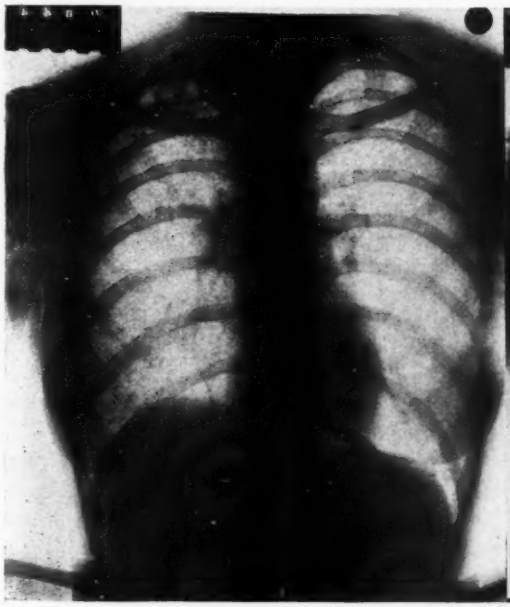

Fig. 8a. Mrs. R. Mc., April 17, 1925, Showing infiltration in right upper lobe with cavity formation.

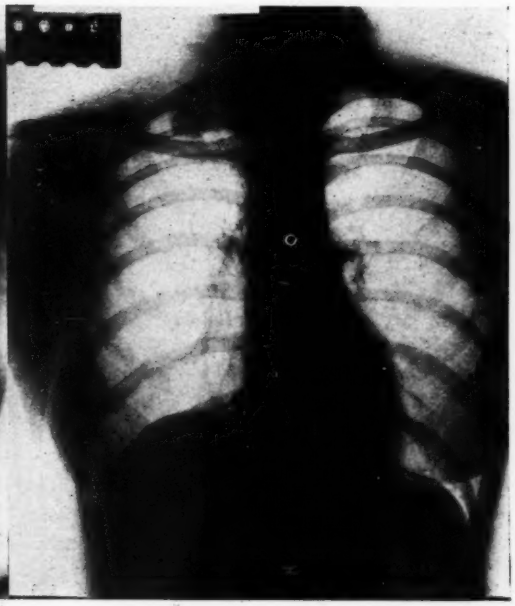

Fig. 8b. Mrs. R. Mc., Nov. 20, 1925. Showing marked density in the right apex, disappearance of the cavity.

are frequently mistaken for atypical pneumonia. The pathological changes found in these cases consist indubitably of few characteristic tubercles but considerable inflammatory reaction in the adjacent pulmonary tissue—in other words, the exudative type of tuberculosis. When the resistance of the host is good, the tendency is toward resolution; when poor, caseation and cavity formation rapidly follow.

The common run of adult tuberculosis, the proliferative type, in which there is healing and progression of the lesion at the same time, shows lessening in the extent of the lesion under the rest cure, but there is almost always a rather extensive residue of fibrous tissue and calcium deposits left at the site of the involved area.

At the beginning of treatment we must give our patient as much information in regard to his problem as we possibly can. Without his co-operation we are usually defeated before we start. It is not easy for patients to give up all physical activity when to outward appearances they are well and have only a little cough and sputum in the morning, and an occasional elevation in their evening temperature. As a general rule patients can be convinced of the importance of getting their disease well under control before starting exercise. The occurrence of a sharp attack of pleurisy or a pulmonary hemorrhage early in the disease usually puts patients in a favorable frame of mind for accepting a sentence of prolonged rest in bed. In institutions, patients who have not had these symptoms themselves often profit by the experience of others.

Rest as a therapeutic measure may be considered as of two kinds: local and general. Neither of these can be efficacious in itself; they must be applied simultaneously and over a period of time if the best results are to be obtained.

We define local rest for our purpose as a functional restriction of the diseased tissues. In connection with this consideration an interesting paradox has been emphasized by Krause. The area of the lungs where normal respiratory movement is least, the apices, seem most prone to active disease, but once established there it tends with fair frequency toward arrest and control. The more movable portions of the lungs show far fewer primary lesions, but once they occur there the process is more prone to rapid dissemination.

Many patients when they first come under treatment have an idea that deep breathing exercises are extremely desirable. They also believe that they should cough at any and all times in order to loosen and expel the "phlegm" collected in their lungs. To anyone familiar with the pathology of tuberculosis it is easy to see how these procedures aid the tubercle bacillus. Except in cases of laryngeal involvement the cough is rather easily controlled by the exercise of a little will power and cessation of physical exertion.

Gilbert and Webb advise their patients to lie on the side of the more diseased lung in order to diminish its expansion. Having tried this in a limited number of cases we found that it caused increased coughing and not a little general discomfort, and decided to have our patients lie in the position in which they were most comfortable.

Adolphus Knopf has his patients cut down the number of respirations. He claims that the average patient can reduce his respirations to six per minute and thereby save the diseased lungs a great deal of work. We believe that cutting down the number will necessarily increase the depth of each respiration. As the disease is usually in the upper lobes, which expand very little in quiet inspiration but do expand with deep inspiration, it seems to us that this method of respiratory control is of doubtful value. Strapping the chest with adhesive tape is valuable in acute pleurisy but probably has little effect in the treatment of parenchymal lesions. Bray has recently shown that when the chest is tightly strapped the lateral expansion of the lung is diminished, but the diaphragmatic excursion on the strapped side is greatly increased.

In unilateral lesions which cannot be controlled by the usual measures we have two methods of procedure of prime importance: artificial pneumothorax and thoracoplasty. The first is applicable in cases with a relatively free pleura; the second does its work well whether the pleura is free or adherent. We prefer pneumothorax when it can be done successfully, because we can discontinue it in case serious disease develops in the good lung, while a lung compressed by thoracoplasty is functionally incapacitated permanently. A mistake that is frequently made is in trying to collapse large upper lobe cavities that are wholly or partially adherent by pneumothorax. The lower lobe, which is often nearly free from disease, is nicely compressed, but the really dangerous lesion is little affected. It is also true that we occasionally rupture a cavity into

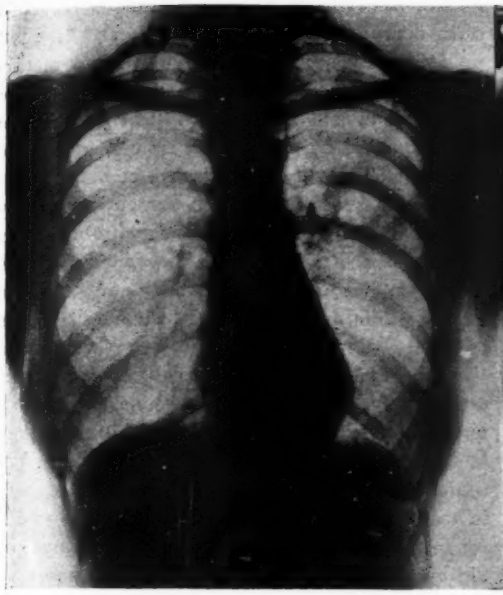

Fig. 9a. Miss E. H., April 22, 1925. Showing a moderate area of infiltration in the middle of the left lung.

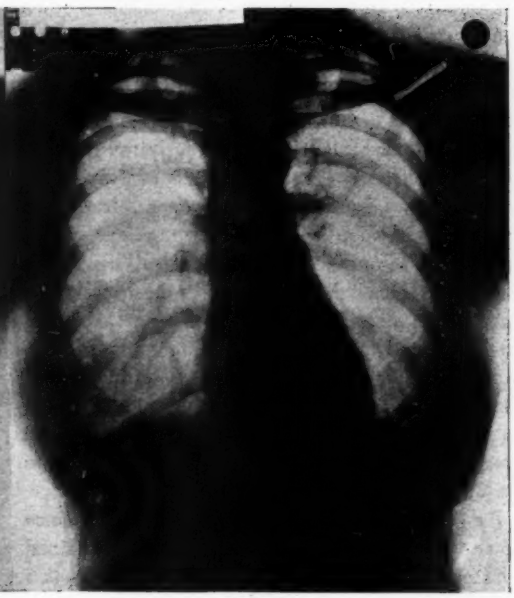

Fig. 9b. Miss E. H., Nov. 16, 1925. Showing obliteration of the costo-phrenic angle on the left side, a slight increase in the hilum shadow, and almost complete resolution of the parenchymal lesion noted in films made six and one-half months before.

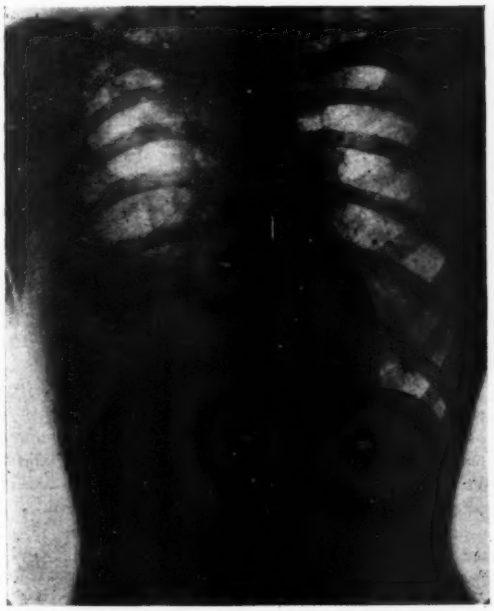

Fig. 10a. Mrs. J. R., June 24, 1925. Shows evidence of marked infiltration in the right upper lobe, with thickened pleura under the right base, with slight infiltration at the left apex.

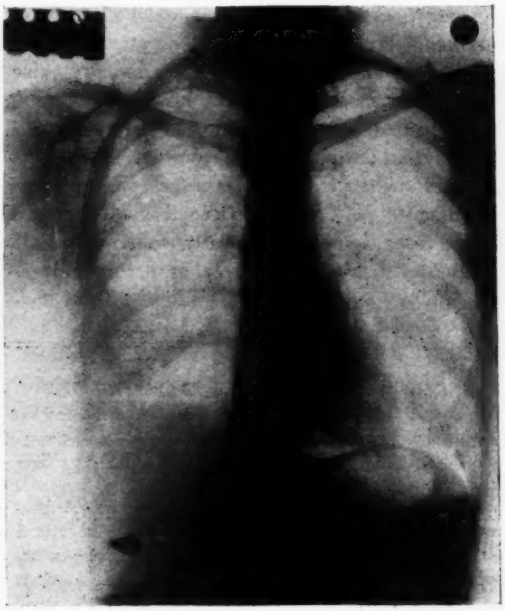

Fig. 10b. Mrs. J. R., Dec. 12, 1925. Shows marked evidence of healing at both apices, and density at the right base.

the pleura by breaking some of the adhesions when the cavity is located near the pleural surface. This is likely to cause a tuberculous pyo-pneumothorax which is a very disagreeable complication. In this type of case the discontinuance of inflation and the institution of thoracoplasty early would give us vastly better results. The success of these methods depends largely upon the proper selection of cases. Their value in closing large cavities, which are always a menace, and in controlling severe pulmonary hemorrhage can hardly be overemphasized. It is also important to remember that pneumothorax and thoracoplasty cases require, if anything, a longer period of bed rest than the general run of patients. We must bear in mind that the patient is combating a serious infection; that one lung is practically put out of use, and that we have partially rearranged the organs of the thorax.

By general rest we mean the absolute avoidance of any bodily fatigue. This can only be obtained by rest in bed in hygienic surroundings. In this way we obtain two objects. In the first place respiratory exertion is reduced to a minimum, and, secondly, we reduce the body metabolism, and conserve the patient's energy to aid him in combating his infection. The length of time patients should be kept in bed depends on the extent of lung involvement, severity of symptoms and their general condition. When the health of the patient has not been seriously undermined we often see the pulse and temperature become normal; night sweats, gastrointestinal symptoms and even the cough and expectoration disappear in a few weeks. As a general rule in the ulcerative cases the sputum is the last thing to go. Some believe that all positive sputum cases should be kept at absolute rest until the sputum disappears entirely or becomes negative. No one will question the desirability of having all positive cases become negative, but it is often difficult of achievement. It is also true that we frequently see individuals who are symptom-free, except for a small quantity of sputum, lose their sputum and bacilli when their lung lesions are stimulated by a moderate amount of exercise or the judicious use of tuberculin, or both.

In recent years it has been our custom to keep patients in bed for a month after their temperature curve has been normal and all symptoms of toxemia have disappeared. The body weight should also be within a few pounds of their normal weight in health. However, in the presence of very extensive lung findings, previous history of severe hemorrhages or complications, the time of complete rest is doubled or trebled. The one disadvantage in this method of treatment that we have had to contend with is that a few patients lose confidence in themselves and do not want to begin exercise for fear of bringing about a relapse. Fortunately, the number of such cases is small, but when we do have them they are a real problem.

SUMMARY

1. Febrile cases of tuberculosis with progressive lesions require absolute bed rest as much as any other general infection that is likely to prove fatal.

2. The control of cough is one of the most important single factors in obtaining pulmonary rest.

3. Pneumothorax and thoracoplasty return to a productive life many tuberculous individuals who would otherwise fill an early grave.

4. We know of no other disease save diabetes in which the co-operation between physician and patient is more important than it is in the treatment of tuberculosis.

BENZYL BENZOATE FOR THERAPEUTIC USE

VanDyk & Co., Twenty Per Cent Aromatized Suspension Made From Benzyl Benzoate (VanDyk & Co.) and Benzyl Alcohol-VanDyk & Co. Omitted From N.N.R.—The Synthetic Drug Corporation (formerly the United Synthetic Chemical Corporation) markets a brand of benzyl benzoate—Benzyl Benzoate for Therapeutic Use (VanDyk & Co.)—and a preparation of it—Twenty Per Cent Aromatized Suspension of Benzyl Benzoate (VanDyk & Co.). The advertising for these was based on the enthusiastic reports that were published when benzyl benzoate was first used experimentally in mdicine. In consideration of the revised estimate of benzyl benzoate, the Council on Pharmacy and Chemistry urged the distributor of these preparations to revise the advertising claims. This revision was not made and, therefore, the preparations have been omitted from New and Non-official Remedies. Benzyl Alcohol-VanDyk & Co. was acecpted for New and Non-official Remedies as a brand of benzyl alcohol-N.N.R. Recently, the distributors — Synthetic Drug Corporation — have adopted the name, "Benzylol" for it and claim this name as a "word mark." The Council on Pharmacy and Chemistry omitted the product from New and Non-official Remedies because it is marketed under a name which the Council cannot recognize. (Jour. A. M. A., April 17, 1926, p. 1233.)

THE PRESENCE OF DIPHTHERIA BACILLI IN THE NASAL CAVITY OF THE NEWBORN*

SAMUEL AMBERG, M.D.
Section on Pediatrics, Mayo Clinic
Rochester, Minnesota

Several authors have maintained that it is not uncommon to find diphtheria bacilli in nasal swabs from newborn infants. The number of positive findings is given as from 2.5 to about 84 per cent.[5,8,10] The incidence of nasal diphtheria is relatively small, as is to be expected from the response of the newborn infant to the Schick test for immunity to diphtheria. From this it is evident that protection is afforded to about 85 per cent of the newborn. The percentage of unprotected infants is sufficiently large to make the prevalence of diphtheria bacilli a real menace. Occasional epidemics in hospital nurseries call forth various efforts to protect the newborn infants against diphtheria. Furthermore, Kirstein reports the occurrence of diphtheria when the immunity of the infant, as measured by the antitoxin content of the blood, should have sufficed for protection. The question has been raised by von Gröer as to whether these were really cases of diphtheria.

Because of the danger to the child and because of the communicable nature of the disease, further investigation seemed indicated. The infants born on the obstetric service of the Mayo Clinic and taken care of by the pediatric department furnished the opportunity for this study.

Cultures were taken from the nasal cavity of 421 newborn infants during a period of about two years. In 182 cases, cultures were taken only once; in 239, on two different days, and in sixteen instances several cultures were taken. The cultures were taken on Loeffler's blood-serum agar and examined by Magath. The classification was made according to Wesbrook, Wilson, and McDaniel. The presence of diphtheroid bacilli was reported in seventeen instances; in one instance a doubtful bacillus was reported; in another there was a bacillus which morphologically had to be classified as a diphtheria bacillus. When more than one culture was taken, the diphtheroid bacilli happened to be found at only one examination.

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No efforts were made to determine the flora, but usually staphylococci were found, more rarely streptococci and other micro-organisms, and there was a small number of inoculations without growth. Occasionally, there was an infant with rhinitis or conjunctivitis. In the latter cases no micro-organisms were demonstrable either by smear or culture. Examination for inclusion bodies was not made.

DISCUSSION

In this series of 421 cases, diphtheria-like bacilli were found in nineteen instances, giving a percentage of about 4.5. Frequently cultures were taken only once. The number of positive findings might increase considerably on more frequent examination. For instance, in Kirstein's series, when cultures were taken daily, 84 per cent were positive. In single examinations positive findings were obtained in about 27 per cent. My examinations were made in an ordinary community. A mild diphtheria epidemic occurred during the period of the examinations, fortunately leaving untouched the obstetric service and nursery.

In 1918, Lietz examined 606 infants in an institution devoted to the teaching of midwifery, and positive findings were obtained in 2.5 per cent. The following year 691 infants were tested with positive findings in 4.2 per cent. In both series, the cultures were examined by a bacteriologist and the diphtheria bacilli identified on the basis of staining with the Neisser double stain, the Gram stain, and 1 per cent hot collargol solution. My figure of 4.5 per cent coincides closely with that in the second series of Lietz. In the one culture in which the bacillus grown could not be distinguished morphologically from a true diphtheria bacillus, it proved avirulent. In the other case some doubt existed as to whether the bacillus grown belonged to the diphtheria or pseudodiphtheria group; the virulence test was not made and repeated cultures were negative.

That the bacilli found in the nasal cavity of the newborn infant belong, in the most instances, to the avirulent group, has been asserted by some authors, particularly by Kritzler. With him and Schoedel, I share the opinion that the clinical significance of these findings may easily be overestimated. It is very difficult, if not impossible, to determine by morphologic or staining characteristics alone, whether a given bacillus belongs to the virulent or avirulent Klebs-Loeffler group or to

the pseudodiphtheria group. Neither the classification of Lietz nor my classification can be regarded as fully established. However, the fact that the bacilli are frequently found at one examination only, that they are so often without clinical manifestation, and that a case of transmission due to one of these infants has not been convincingly shown, prevented me from extending my investigation further.

The frequent occurrence of diphtheria bacilli in the nasal cavity of the newborn is to be separated from the problem of diphtheria of the newborn.[1,2,3,7,9] It is certain that diphtheria of the newborn does occur, and it seems that the nasal cavity in the newborn infant is the seat of predilection. Since the clinical course may be very mild, such cases can easily be overlooked and regarded as rhinitis. They may be dangerous to the infant as well as to the community. A discussion of this problem is not pertinent to the present subject.

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PRINCIPLES OF SUCCESSFUL CANCER SURGERY*

WILLIAM E. GROUND, M.D., F.A.C.S.
Superior, Wisconsin

The steady increase in the death rate from cancer, in spite of enormous funded research work and improved operative skill, has bred a condition of pessimism and apathy in the profession and of despair in the public. There is no reason for this other than the ignorance of the true nature of cancer.

To better our cancer results we must, as is universally admitted, see such patients earlier, for there is no cure for cancer that is worthy of the name that can successfully cope with advanced cancer. If cancer were not diagnosible and easily curable in the early stages we would have some excuse, but when the opposite is true, why stand we here idle? If half the time and energy were expended in teaching the busy practitioner, overwhelmed as he is with his multiform duties, the simple and easily recognizable indications of early cancer and pre-cancerous conditions, as is given to exploiting some special cancer treatment or draping the scenery with a few exceptionally brilliant, radical operations, we could get at the root of cancer sooner. The physician should know early cancer and what leads to cancer, and teach his patients these elementary truths. This is the first fundamental of successful cancer surgery.

We must realize and keep constantly in mind the practical fact that cancer is primarily a local disease that tends to become, and sooner or later does become, essentially a systemic affection unless blocked by surgery; that, preceding the initial local manifestation of cancer, there exists at the site of cancer development, for a greater or lesser length of time, a lesion or point of so-called chronic irritation that can be correctly called pre-cancerous. Chronic irritation in a carcinogenetic sense is a vague term and absolutely devoid of significance. Some kinds of chronic or local physical disturbance will produce cancer and many kinds will not.

Cancer starts at some vantage point, the sites of which are well-defined and are most accessible to chronic irritation and infection. I have in mind more particularly the malignancies of the epithelial

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type. From the original focus it spreads centrifugally along the lymphatics in all directions, with the lymph stream as well as against it, but more readily with it. There is very little current in the lymph stream. The cancer cells follow along the lymphatics until a lymph node is encountered. Here the cells are retarded for a greater or lesser length of time, depending upon unknown factors. Unquestionably the lymph glands are lines of defense that stay the progress. They are usually overwhelmed and the cancer breaks through their capsule invading surrounding tissues, or proceeds on through efferent lymphatics to affect other glands. It is possible, and, I believe, occurs oftener than we think, for these glands to overcome the cancer invasion. For practical purposes the blood stream can be ignored as a factor in the dissemination of cancer.

Cancer is what it is by virtue of its existence in, or encroachment on, vital organs or to metastases. When toxemia exists or accompanies malignancy it is due to secondary infection. Cancer has no demonstrable systemic toxic factor of its own.

In the absence of pyogenic infection, intrinsic cancer of the breast never kills, but, owing to the limited lymph node defense, it early disseminates far and wide to vital organs. Cancer of the bowel disseminates slowly owing to early block by lymph nodes. Cancer of the uterine cervix soon reaches the adjacent lymph glands, does not metastasize widely and kills by ureteral obstruction, secondary septic infection or peritoneal involvement; cancer of the tongue by secondary infection, starvation or maybe suffocation.

No one procedure is applicable to every cancer, phase, or stage of cancer. There are a few fundamental principles, however, we must observe. The growth should be removed completely with the least possible chance of favoring dissemination. The idea is to kill the intruder on the spot. Don't touch it until it is dead or thoroughly quarantined. In cancer surgery conservation of tissue or cosmetic effects are not to be primarily considered. Only those agencies definitely known to be effective should be considered in the surgery of cancer. They may be classed as mechanical, chemical or thermal. *X*-ray and radium cannot be classed as dependable cancer removers. Their effects are too uncertain and their modus operandi too much in dispute.

Among the agencies usually employed are the cutting, open or bloody operations. They necessitate considerable mechanical manipulation such as cutting, clamping, sponging, tying, dissecting with consequent bleeding and opening raw surfaces, proceedings all favoring cancer dissemination. The cold-steel, cutting operation has been carried out by the best surgeons under the best possible conditions and yet the cancer death-rate continues to climb. Either cancer is terribly on the increase, or we have been living in a fool's paradise. Of course, we probably get most of our cases too late, but at that we should have something to show for radical operating and complete operations. I look in vain for consolation. The cutting, radical or complete operation has gone about as far as skill and anatomical possibilities will allow.

After all, what can we mean by a complete operation? Do we mean that the last vestige of cancer is removed? This is hardly possible except in the very early cases. We can only mean that we have removed a handicap, the central focus of infection, and Nature does the rest. Perhaps we have been attacking Nature's defenses too ruthlessly, and following the pathologist too diligently. There is the idea all too prevalent that Nature is powerless against cancer; that if a cancer nest remains a recurrence is the inevitable result. Later teaching proves this to be a fallacy and acute clinical observations bear it out.

During a trip abroad two years ago, I sojourned in London considerable of the time and had occasion to hear the expression of more than one British surgeon regarding the paucity of results in operating cancer. Notably among these was Herbert J. Paterson. I had the opportunity of attending the annual meeting of the British Medical Association at Portsmouth. At that meeting before the Surgical Section Mr. Paterson read a paper entitled: "Are the Results of the Operative Treatment of Cancer Better Than Twenty Years Ago?" He concluded that they were not, and during the rather lively discussion that followed, I did not hear any speaker radically disagree. One or two intimated that they thought he should not talk so plainly. Most of the discussors emphasized early diagnosis. Among these was Charles P. Childe, then President of the British Medical Association. Mr. Childe occupies a position in Great Britain on the cancer question similar to that of Bloodgood in this country.

I quote a few sentences from Mr. Paterson's paper. He says, "I imagine that there are few of us who do not feel depressed at the poverty of our success when we reflect how small is the number of cases in which complete freedom from recurrence follows operation for cancer." He calls attention to the extent that primary mortality has been reduced, but he goes on to say: "From the point of view of remote results have we similar cause for satisfaction? Most of us have had isolated cases of freedom from recurrence for ten or even twenty years, but on the whole the proportion of those free from recurrence after five years appears to be about the same as it was twenty-five years ago. When I was house-surgeon I traced the results of the operation for mammary cancer performed by my chief, the late Mr. Alfred Willett. I found that 42 per cent of the patients were free from recurrence after three years, and 33 per cent after five years. In 1902, Mr. Thomas Bryant published a series of cases showing 50 per cent free from recurrence after five years and 32 per cent alive and well after ten years. It is not without significance that both these surgeons practiced what today would be considered a very inadequate operation. The axilla was not cleared out as a routine measure, but only when there was evidence that the glands were grossly diseased. It is interesting to compare these figures with those of Halstead, and the results of the more radical operation by his name. In spite of a more extensive operation his results appear no better than those I have quoted. He reported 46 per cent of the patients dead within three years, and 41 per cent alive and free from recurrence after three years. As regards cancer of the rectum, Mr. Harrison Cripps was able to report that 42 per cent of his cases were alive three years after operation, and most all of them were perineal excisions. Not many of us can show better results." In conclusion, Mr. Paterson remarks: "I need hardly add that nothing I have said is meant in the slightest degree to discourage operations for cancer, or to under-rate their necessity. My plea is for earlier and therefore less extensive operations and especially operations in two stages whenever practicable—that is, removal of the growth, and of the glands at a later period. Let us not be in a hurry to remove Nature's first line of defense."

So far as treatment is concerned, cancer may be classed as pre-cancer, initial cancer, progressed yet operable cancer and inoperable cancer calling for palliation only. A pre-cancer lesion is one which is very likely to develop into cancer. An initial cancer is dogmatically limited to the organ primarily involved. A progressed cancer has extended beyond the confines of the original site.

A cancer is early and operable as long as it can be reached and has not involved vital structures. By vital structures we mean those that cannot be mutilated or removed without too great a menace to life. The malignancy of cancer varies greatly, so that the time factor loses weight. It may have existed a long time and still be early, or it may be a late cancer so far as progress is concerned, although of comparatively short duration. Only clinical acumen will afford a wise decision.

Any lesion occurring in a person of cancer age, in a cancer site, preceded often by evidences of abnormal condition or local irritation that so closely resembles malignancy as to suggest the microscope, had better be treated as cancer first and submitted to the microscope afterward for classification. In other words, don't depend on the microscope for diagnosis or a line on treatment. History, the naked eye, appearance, and the sense of touch or feeling will do more than the microscope. McFarland, in his Surgical Pathology, says: "Cancer was never found by microscopic examination when it was not suspected from what the finger and naked eye had found, though occasionally what the eye and finger thought to be cancer was shown by the microscope to be something else." Diagnosis by realization, and not by confrontation, is only permissible in cancer.

It is frankly conceded that the manipulation of a cancer mass is reprehensible and liable to further dissemination. This has been demonstrated, experimentally, too. Cancer surgery requires at all times the utmost gentleness of manipulation.

Average surgeons, used to operating under general anesthesia, are, in my opinion, anything but gentle. They rarely make good technicians with local anesthesia. The technical training local anesthesia furnishes is a good adjunct to cancer surgery.

Mammectomy is a good criterion. Most surgeons are very particular to clean out the axilla first. After all palpable glands in the axilla are dug out the breast itself with the obnoxious lesion is released. Now, what is the reason for this ritual? Presumably to prevent the massaging or squeezing of cancer cells along the lymphatics towards the axillary glands. In other words, to minimize dis-

semination. But, does it do it? Cancer of the breast, *per se*, never kills. Then, wherein lies the danger of breast cancer? In the metastases. What metastases from mammary carcinoma kill? Those to the mediastinum, bones and liver. What route do cancer cells take to get to the liver and inside the chest? They travel through the chest wall directly under the breast or down the wall by way of the ligamentum teres to the liver. The dissemination is not so much by way of the axillary system, for here the lymphatics empty directly into the blood stream and we know cancer cells cannot live in the blood circulation. What, then, is the significance of affected axillary glands? This simply means that the cancer process has gotten beyond the confines of its original site, the breast. It means that if the axillary glands are reached the chances are that the intra-thoracic glands are also, or that the process is well on its way to the liver. Suppose, after breast removal, a continuance should later manifest itself in the axillary glands or in the neighborhood of the original operation. Remove them, of course. If grossly affected, I destroy the axillary glands after I remove the breast by a diathermy needle. Why remove the breast first? Simply to disconnect the source of infection as soon as possible from its line of advance to vital organs. While we are working in the axilla the breast gets more or less manipulation, trivial, perhaps, but some. Then, why take a little more chance, since it can serve no useful purpose? It would be more sensible, it seems to me, to begin at the navel and dissect up than at the axilla and dissect down. Another thing about enlarged glands is the fact that there is a fair chance that they are not carcinomatous at all but the result of inflammatory reaction and will subside when the offense is removed. This I have often noticed.

There is a surgical procedure that does not involve manipulation of the lesion, that is less bloody, requires less sponging, tying and opening of raw surfaces; a procedure that seals the open vessels, and is in itself lethal to the cancer cell immediate and adjacent; and finally, what is not to be lightly considered, has no operative mortality. Why not give it the benefit of the doubt since it cannot possibly be as bad as the cold steel operation?

Heat, and of a comparatively low degree, has been proven over and over again to be lethal to cancer cells. Cancer cells are rendered impotent or killed when exposed to a temperature of 113 F. for ten minutes, whereas differentiated tissue cells require 140 degrees for a like time for their destruction. This fact is appreciated by most surgeons, but the difficulty of its application has been the drawback. Successful technic in the use of heat in cancer surgery is more difficult to acquire and to apply than that of the knife. Heat surgery requires complicated apparatus in charge of the surgeon's own trained staff, for in no other type of surgery is teamwork more necessary. The surgeon who applies this agency must know the effect of different degrees of heat on the tissues involved. He must select the type of instrument necessary to apply the degree of heat demanded in the particular operation or stage of the operation in progress. The dissecting process requires red or white heat, quickly and deftly applied with a knife-like electrode. Hemostatic effects are produced by dark heat which seals by coagulation. Dark heat or cold cautery is demanded where deep heat penetration is desired as with the Percy cautery. Here heat must be maintained in contact for a considerable time without tissue carbonization. Carbonization or burning prevents heat penetration. White heat burns; dark heat cooks or coagulates. In many of the conditions where I formerly used the Percy cautery for deep heat penetration I now use electro-coagulation or surgical diathermy.

The last few years electro-coagulation has received a great deal of attention in this country. It is the finesse in heat application in cancer surgery. It admits of fine adjustment, from mass destruction to the delicate desiccating spray. For many years I have used the cautery exclusively in all my cancer work. This includes hysterectomies for uterine cancer as well as breast amputations. Without going into details I know my results have been better by comparison with the results of cutting surgery. Breast amputations are done with the cautery knife. If the technic is correct, dissections can be made just as rapidly and with as delicate precision with the hot knife as with the cold. The knife should be glowing and with instantaneous touches the tissues are severed and no time is given for the heat to be transmitted where it is not wanted. The removal of glands, for instance those adjacent to delicate structures, can be accomplished with the utmost accuracy and without fear of injury. Those witnessing the hot knife dissection for the first time or unfamiliar with the postoperative course often remark that there must be a lot of after-pain and

interfered healing. The opposite is true. There is usually less pain and the healing is just as good, if not better, than when the cold knife is used. There is less pain because the heat obtunds nerve sensation, and the wound is not as liable to become infected. There is less oozing and serous discharge after the use of the hot knife. In other regions of the body, from which it is deemed advisable to remove malignant growths, the hot knife procedure is just as practicable. These facts are accepted by my associates, assistants, and nurses at the hospital where I have worked for many years.

The last two or three years I have used electro-coagulation extensively, often in conjunction with the cautery knife. When lymph glands are to be treated I do not dissect or dig them out, but thrust in a diathermy needle and coagulate them. I have used the radio knife extensively and it is a surprisingly delicate and effective way of separating tissue. The radio knife is the term by which this instrument is best known; so-called because the energy is furnished by modification of the transmitter circuit of the radio outfit. The process is called "Endotherm" by Wyeth, and Kelly prefers the name "Acusector." The tissues are separated by undampened waves of the high-frequency current applied through a needle. The process is not cutting as is usually understood, but a molecular disintegration by the formation of an arc between the needle and the tissues. If the needle is pressed on the tissues no arc is formed and the structures retain their integrity. The line of separation is slightly coagulated and consequently less bleeding ensues. There is little heat produced, and the wound heals as well as after the use of the knife unless the technic is faulty.

The fundamental principles of the application of heat in the treatment of cancer were established in 1889 by Dr. John Byrne of Brooklyn. Dr. Byrne reported 20 per cent of his cases of cancer of the uterus treated by high amputation of the carcinomatous cervix by knife cautery as alive and well five years after. There was no operative mortality. Who does better today, especially when we consider the lateness at which he must have received his cases?

My practice in cancer of the cervix is as follows: If it is limited to the cervix, a high amputation is made by the cautery knife or its destruction is effected by electro-coagulation. If there is uterine fixity, indicating involvement of parauterine tissues, I resort to electro-coagulation or the Percy cautery. Outward exuberant cancer growths are destroyed by electro-coagulation; and the basic growth is treated by further electro-coagulation or cold cautery as seems best in that particular case. I have an antipathy for fixed methods.

Give cancer the heat treatment; for after all it is heat that does the business, whether actual cautery, electro-cautery as administered by low frequency current, or high frequency electro-coagulation or desiccation. There is no virtue in the electricity except the heat it furnishes. However, there is this about the heat produced by the high frequency current: it is generated in the tissues by tissue resistance. A large or indifferent electrode is placed on any convenient body contact. The active electrode is a needle point. The de Arsonval current is then passed through the body of the patient and is concentrated at the needle point in or around the growth to be destroyed. The needle itself does not get hot, but the surrounding tissues do, so that there is coagulation immediately around the needle. Around the coagulated zone for an indeterminable distance there is a sub-coagulation temperature. In this zone there is a temperature that it is reasonable to suppose is a menace to cancer cells without devitalizing the normal tissues. Herein lies the advantage of surgical diathermy. All other heats are of extraneous origin; that is, the cautery point is hotter than the surrounding tissues.

We have in preparation a paper wherein we set forth in detail the indications and advantages of the various operative measures calculated to give the best results. The utmost confusion exists regarding the nature, differences and applicability of the various surgical thermic agencies. These resources include what is designated by Howard Kelly and his associates of Baltimore as "The New Surgery."

MINNESOTA MEDICINE

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EDITING AND PUBLISHING COMMITTEE

R. E. FARR, M.D. Minneapolis
JOHN M. ARMSTRONG, M.D. St. Paul
L. B. WILSON, M.D. Rochester
A. A. LAW, M.D. Minneapolis
J. T. CHRISTISON, M.D., St. Paul

EDITORIAL OFFICE
CARL B. DRAKE, M.D., Editor
402 Guardian Life Bldg., Saint Paul

BUSINESS OFFICE
J. R. BRUCE, Business Manager
2429 University Avenue, Saint Paul
Telephone: Nestor 1381

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EDITORIAL

The State Meeting

During the past two years there has been a noticeable awakening of interest in our State Medical organization. Our president, Dr. H. M. Johnson, with a group of members inspired by him, has been largely responsible for this. The association never had a more devoted member than President Johnson, who as chairman of the legislative committee in 1925 and president in 1926, has worked so effectively and at great personal sacrifice for the good of the profession in this state.

Encouraged by what has already been accomplished in legislative affairs and in improved organizational administrations under our secretary, Dr. E. A. Meyerding, and bent on making greater strides in the future, our members have been willing to dig down into their pockets and furnish the wherewithal. The members do not object to spending their money in dues if they get something for it.

One matter in which the association should act and is going to act, is in relation to the attitude of Dean Lyon of the University Medical School towards medical practice. The unfortunate radio speech made by the dean over WCCO, February 5, 1926, in which he extended an invitation to people all over the country to come to the University Hospital as private patients, rightfully aroused the profession of the state. The admission of pay patients to the University Hospital is a matter of policy and may well be a necessity in order to obtain high-grade professors. Usual medical ethics, however, prohibit the use of such methods to obtain private patients. If the radio speech mentioned is an attempt to further the cause of state medicine, as some believe, it is a step with which the members of the State Association are, to say the least, not in sympathy. The Dean's views on the desirability of socializing the practice of medicine are well known. We do not question his sincerity when he made the statement at the Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals, on March 10, that "The sooner physicians get over their unfounded opposition to the socialization of medical practice and begin to work for it, so far as it may be necessary to secure good medicine for all the people, the better it will be for the people and for physicians." We heartily disagree.

The State Medical Association has repeatedly taken a stand as opposed to the socialization of medicine. This opinion has been reiterated in the journal from time to time. There is no sympathy between the medical profession of the state and the views expressed by Dean Lyon. Socialism seems to be the issue.

Instead of going into personalities or endless discussion, the House of Delegates simply passed the resolution which appears on page 351 of this issue, and the committee after a careful inquiry will take the matter up with the University authorities.

After watching the course of the recent state meeting we cannot but feel that our meetings should have more section gatherings. The combined meetings are of value, but we would recommend a happy admixture of section and general gatherings next year.

We do wish to mention here the inspiration which Dr. Charles P. Emerson, Dean of the Indiana

University School of Medicine, brought to our meeting. His speech at the banquet was a gem and we hope to be able to reproduce it for our readers at a later date.

We were particularly fortunate in having Dr. Morris Fishbein at the convention. His address on Fads and Quacks was not only instructive, but most entertaining.

It can be said without fear of successful contradiction that the meeting as a whole was a great success.

The Dallas Meeting

The recent meeting of the American Medical Association, held at Dallas, April 19 to 23, was a most satisfactory one from every point of view. It was the first time that the association has held a meeting in the great state of Texas, and the very hospitable entertainment tendered the association by the people of Dallas was ample evidence that the House of Delegates made no mistake in choosing that progressive city for its 1926 meeting.

The House of Delegates met promptly at 10 A. M., April 19, and 114 delegates were registered at the opening of the first meeting. All meetings of the House of Delegates were characterized by earnestness on the part of the delegates and the prompt dispatch of the business of the association, under the able leadership of the Speaker, Dr. F. C. Warnshius.

Dallas furnished exceptional facilities, both in hotel accommodations and in housing the technical and scientific exhibits, and in meeting places for the various sections of the scientific assembly. All these were housed at the Fair Park, the exhibition buildings of which were admirably adapted for exhibits, both technical and scientific. Hardly as much could be said for the meeting places for the sections, as these were necessarily portions of the building partitioned off with the usual disadvantage of such temporary quarters, in their lack of light, ventilation and proper acoustics. The accommodations, however, were quite as good as at other meetings in the recent past.

The technical exhibit was at all times the center of attraction and in size and diversity of exhibits has seldom been equaled. The growing interest in the scientific exhibit attests its value, and it is safe to say that it was by far the most popular, judging from the number of doctors who visited it. We regret that space does not permit mention of some of the more important exhibits.

As in previous meetings, fresh anatomical material illustrating interesting pathological processes was shown and demonstrated by competent attendants. Diagnostic clinics, illustrated by lantern slides and moving pictures, were a source of great interest, and attracted large crowds.

There were registered 4,179 members of the association in attendance at the Dallas meeting, the largest number to attend any meeting held in a southern city. The medical profession in Texas is well organized and the profession turned out almost to a man.

The program of entertainment arranged for the visiting doctors and their wives by the local committee of the Dallas County Medical Society deserves especial mention. Seldom has anything been attempted on so large a scale as the barbecue luncheon held at the Fair Park, Wednesday noon, tendered by Dr. and Mrs. John Dean and the Dallas County Medical Society. Notwithstanding a downpour of rain all day Wednesday this luncheon was served to all who cared to partake. In the evening, section entertainments were tendered at the various hotels. On Thursday a Mexican dinner was served at the Fair Park, and on Thursday evening the President's reception and dance. Dallas lived up fully to tradition in extending to the members of the association a generous southern hospitality.

By strange coincidence the meeting of the association took place on the week of the 90th anniversary of the battle of San Jacinto, which means so much to the Texans, for from that day they date their independence from Mexican rule. April 21 is for them their most significant holiday.

The meeting was characterized by a splendid program, and no one who attended could have failed to bring away with him a higher appreciation of the great organization to which he belongs.

The House of Delegates elected for its next President, Dr. Jabez N. Jackson, of Kansas City, there being no other name proposed; for Vice President, Dr. John O. McReynolds, of Dallas, Texas, was elected.

Washington, D. C., was selected as the place of the meeting in 1927.

F. L. R.

The Blood Picture in Pertussis

In the present age of elaborate and complicated blood tests as diagnostic aids, many of the earlier and simpler ones are frequently overlooked and not utilized to their fullest value, for example, the total leucocyte and differential white cell count in pertussis. At the present time much is being written of the blood chemistry, especially the phosphorus content in pertussis, but such determinations call for more complicated apparatus and technical assistance than is available in the offices of the majority of physicians. On the other hand, a white and differential count is easily done while the patient waits, and is of real value in making a diagnosis in pertussis. A child who is coughing may or may not have pertussis and an early diagnosis will be of great value in the prevention of contact cases.

From 1905 to 1911 the literature contained many references to the white and differential count as a diagnostic aid in whooping cough, but since that time, although still recognized, it has not been utilized to the fullest extent. In the catarrhal stage there is a moderate leucocytosis with a high percentage of lymphocytes, which distinguishes it from respiratory infections where the leucocytes either remain normal in number and relationship or else show an increase in number, as well as percentage, of polymorphonuclears. In the paroxysmal stage of pertussis the increase in both total number and percentage of lymphocytes is yet more marked, but this ceases to have diagnostic interest since by this time the clinical symptoms are very typical. A slight eosinophilia up to 3 per cent is sometimes found in the convalescent stage, but this rise is too slight and occurs too late in the disease to be of any significance.

The total white count as well as the percentage of lymphocytes varies with the age of the child, but in typical cases of pertussis the figures usually run high enough to put them beyond the borderland into the definitely pathological class. In blood examinations made at the Miller Clinic on 100 children coming in for general examination, or for treatment for conditions other than whooping cough, there was an average leucocyte count of 9,300, with an average of 48 per cent polymorphonuclears and 50 per cent lymphocytes. On the other hand, blood examinations upon 100 children suffering from whooping cough in the early stages showed an average leucocyte count of 15,300 with 41 per cent polymorphonuclears and 56 per cent lymphocytes. From these results it seems that there is comparatively little difference between the percentage of lymphocytes in the two series, but when the total leucocyte count is taken into consideration it becomes apparent that there is a great difference between the total numbers of lymphocytes in the two groups.

There will always be borderline cases where the blood count will be of little value in a differential diagnosis between pertussis and acute respiratory infections, but in the majority of cases this simple procedure will be a very material aid. Many of the cases in the pertussis group showed a high count, 19 per cent being above 20,000, and they ran as high as 41,000. The percentage of lymphocytes went as high as 85 per cent, and in 22 per cent of the cases it was above 70 per cent. Therefore, with a total count above 15,000 and a percentage of lymphocytes of 60 per cent or above, in a child who is coughing, the blood examination is of material help in making the diagnosis of pertussis.

MARGARET WARWICK.

Dr. John Van Reed Lyman: An Appreciation

Although our Journal is primarily most vitally interested in the local happenings of our own state, we cannot well forego the important duty of considering briefly the great loss recently sustained by our sister state, Wisconsin, the medical profession at large and the surgical profession in particular, through the death of Dr. John Van Reed Lyman of Eau Claire. The exceptional surgical ability, staunch integrity and humane character of Dr. Lyman call for more than passing notice.

Dr. Lyman graduated from Rush Medical College in 1880 and located at once in Eau Claire where he practiced for forty-five years. Early in his career he began doing surgery, a vast percentage of which was carried on in country homes after long and strenuous drives and amid great hardships. Largely through his efforts hospital facilities were created in his home city and he toiled unceasingly night and day in an effort to meet the demands of a tremendous practice. He was a giant in stature, being over six feet six inches tall, and was possessed of unlimited energy. His inherent kindness made it impossible for him to refuse calls to attend the sick regardless of the hour or the location of the patient. He therefore became the prototype of the old family physician and was known as the "family surgeon," as

he numbered among his clientele many of the third generation.

Notwithstanding his splendid physique, Dr. Lyman was the victim of a chronic gastric ailment which not only caused him great suffering at times but necessitated his relinquishing his practice for long periods upon several different occasions. In spite of this handicap his standing with the profession and people was such that upon each occasion when he resumed his practice, he found that instead of diminishing it had increased — a most unusual experience and one which demonstrates the esteem in which he was held.

Throughout his entire professional life, strenuous though it was, he always found time to cover all important medical meetings with the utmost regularity, nor was his postgraduate study limited to this method. He made frequent trips abroad and was an inveterate attendant at the well-known clinics in this country. The writer well remembers when, as a student at Rush Medical College, Dr. Lyman, whom he had known as a boy, could be seen every Thursday afternoon in the front row earnestly and interestedly attending the clinic of Dr. Nicholas Senn. Thus for many years this busy surgeon found time to leave his practice and spend each Thursday during the school year in Chicago—a true index of the kind of man he was.

His medical writings were few, as his modesty and diffidence prevented him from appearing on programs with the regularity which his experience and ability warranted. However, the articles he has written are masterpieces and his discussions were concise and logical.

Many medical organizations have felt the imprint of his splendid personality and the success of the Interstate Assembly, of which he was one of the past presidents, is due in no small part to his unceasing labors.

The characteristics of the man can be no better exemplified than by recounting an incident which took place a few years ago when the writer attended a medical meeting in Eau Claire. The meeting came to a close at 2 A.M. A physician who was Dr. Lyman's senior by a number of years was to catch the train for his home in a distant city at four. Dr. Lyman insisted upon driving him to the station, keeping him company during those hours, and when he was leaving quietly handed him railroad and Pullman tickets despite the protests of the older man, who for the time being had entirely forgotten to purchase his tickets.

During the last months of his life he sustained a fracture of the femur and was also forced to undergo a severe stomach operation. Like most physicians, he had accumulated but little of this world's goods. He had, however, and his family will have, the satisfaction of knowing that he stored up treasures of a vastly more important nature, the love, esteem and good-will of his fellows. Our profession needs more men of his type.

A Change of Address

The St. Paul and Minneapolis offices of MINNESOTA MEDICINE have been combined and are now located at 2429 University Avenue West, St. Paul, Minnesota. All communications, including material for publication, should therefore be sent to this address in the future.

OBITUARY

DR. FRANCIS R. WOODARD*

Francis Reubin Woodard was born in Madison, Ohio, July 15, 1848. He came to Rochester, Minnesota, at the age of 10, and was a pharmacist in his father's drug store there before studying medicine.

He attended the Universities of Minnesota and of Michigan, and later went to Rush Medical College, from which he graduated in 1879. Following this he took a course of clinical study in the wards of the Cook County Hospital, Chicago, and then began practice in Claremont, Minnesota, where he stayed until 1881.

Dr. Woodard carried on an active practice as a general practitioner and surgeon from 1881 to the time of his death. He was associated at one time with Dr. J. Warren Little and later with Dr. Wm. H. Newhall. He served on the surgical staff of the Asbury Hospital, City Hospital and Swedish Hospital at different periods. He was a member of the City Board of Charities and Corrections from 1886 to 1900 and president of it for many years. He was a member of the county, state and American medical societies. He joined the Minnesota State Medical Society in 1880, when Alex J. Stone was president. Dr. W. W. Mayo, father of William and Charles Mayo, was on the committee which examined his credentials.

Dr. Woodard was a member of the Athletic Club, the Masonic Lodge and the Park Avenue Congregational Church of Minneapolis.

Dr. Woodard was actively engaged in practice up until about three months ago, when he went to Florida, where he stayed until his death, which occurred at St. Augustine March 29, 1926, at the age of 78. He had completed forty-seven years of practice, including hospital and public welfare work, forty-five of which had been spent in Minneapolis.

*Read at the meeting of the Hennepin County Medical Society, held May 3, 1926.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEETING

The fifty-eighth annual session of the Minnesota State Medical Association was held in St. Paul May 17 to 19, 1926. Of the 2,000 members, 605 registered. While the registration last year in Minneapolis reached the number 736 and the registration in recent years has surpassed this year's figures, there was no sign of waning interest.

The House of Delegates handled the various problems presented in a conservative, businesslike way, utilizing reference committees instead of resorting to endless wrangling. Perhaps the most important action taken was raising the State Association dues to $15. Present association activities and future plans so impressed the members that there was no difficulty in obtaining a four-fifths vote of the House of Delegates necessary for such an increase.

Without lengthy discussion the following resolution was passed:

BE IT RESOLVED, That the Minnesota State Medical Association disapproves of the general policy of admitting pay patients to the University Hospital.

BE IT FURTHER RESOLVED, That a committee of seven, including the President of the Association, Dr. H. M. Johnson, who shall be an active member of this committee, be appointed by the President of the Association, and after having fully informed themselves concerning the problems affecting the medical school, arrange a conference between this committee of the Association, the President of the University of Minnesota and representatives of the Board of Regents of the University to consider what the future policy of the University shall be concerning these problems and other problems which may present themselves concerning the medical school and the medical profession.

BE IT FURTHER RESOLVED, That the Minnesota State Medical Association reasserts its stand previously taken against the socialization of medicine and state medicine.

BE IT FURTHER RESOLVED, That the members of the Minnesota State Medical Association do hereby express their willingness to co-operate with the Board of Regents of the State University of Minnesota and others in authority to the end that an abundance of suitable clinical material, secured entirely from the ranks of the worthy poor, may be available for medical instruction, and pledge their support in securing public and private funds for this purpose;

BE IT FURTHER RESOLVED, That a copy of these resolutions be spread upon the minutes of this Association, and copies sent to the President of the University of Minnesota, and to the President of the Board of Regents.

A revision of the constitution and by-laws of our State Association was submitted by the special committee of which Dr. Frank Savage was chairman. The changes in the constitution, which for the most part were minor in importance, will lie over until next year. The changes in the by-laws adopted at the second meeting of the House of Delegates included: (1) provision for emeritus members; (2) privilege of the House floor to committee chairmen and A. M. A. delegates; (3) supervision by the council of expenditures in the publication of MINNESOTA MEDICINE; (4) the formation of committees on public health education, radio broadcasting, hospitals and medical education.

The following officers for 1927 were elected: President, Dr. W. F. Braasch, Rochester; first vice president, Dr. H. B. Aitkens, Le Sueur Center; second vice president, Dr. S. H. Boyer, Duluth; third vice president, Dr. F. D. Gray, Marshall; secretary, Dr. E. A. Meyerding, St. Paul; treasurer, Dr. Earle R. Hare, Minneapolis. Dr. Melvin S. Henderson, Rochester, was elected councilor for the first district and the appointments of Dr. L. Sogge, Windom, and Dr. W. A. Coventry, Duluth, as councilors of the second and ninth districts, respectively, were confirmed. Dr. W. L. Burnap, Fergus Falls, was elected delegate to the American Medical Association and Dr. John L. Rothrock, St. Paul, was re-elected to the same position. The three newly elected alternates to the American Medical Association House of Delegates are: Dr. W. A. Coventry, Duluth; Dr. O. J. Hagen, Moorhead, and Dr. R. T. La Vake, Minneapolis.

The next annual meeting will be held in Duluth in the spring of 1927.

McLEOD COUNTY MEDICAL SOCIETY

The McLeod County Medical Society held their annual meeting at the office rooms of Drs. Schmidt and Langhoff, May 29, 1926, at Glencoe, Minn.

The meeting was opened with election of officers, Dr. W. R. Schmidt being elected president and Dr. A. H. Langhoff, secretary. Topics relating to the interest of the medical profession were openly discussed.

A banquet followed the general meeting, after which papers were presented by Dr. John Shellman of St. Paul, Minn., and Dr. J. P. Schneider of Minneapolis.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Officers for the coming year were elected at the meeting of the Minnesota Academy of Ophthalmology and Otolaryngology held in Minneapolis, May 14, as follows: President, Dr. John L. Shellman, St. Paul; first vice president, Dr. W. E. Camp, Minneapolis; second vice president, Dr. Frank Knapp, Duluth; secretary-treasurer, Dr. John H. Morse, Minneapolis. Those elected to the Council were Dr. Harold Rothschild, St. Paul; Dr. W. E. Patterson, Minneapolis, and Dr. H. E. Binger, St. Paul.

The meetings of the society are held monthly and it was decided to hold meetings in Duluth and Rochester hereafter as well as in the Twin Cities.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

The annual meeting of the Stearns-Benton County Medical Society was held Thursday, April 15, at St. Raphael's Hospital, St. Cloud. Dinner was served at 6:30 and was followed by election of officers. Those elected for the coming year were: President, Dr. J. N. Libert, St. Cloud; vice president, Dr. A. F. Moynihan, Sauk Center; secretary-treasurer, Dr. P. E. Stangl, St. Cloud. Dr. C. B. Lewis of St. Cloud was elected delegate to the State Association meeting with Dr. J. H. Beaty, St. Cloud, as alternate.

Dr. Ralph Davis of the U. S. Veterans Bureau gave a Neurological Clinic following the business session.

OF GENERAL INTEREST

Dr. S. F. Herrmann, formerly of Welcome, Minnesota, is now located in Rochester, Minnesota.

Dr. C. F. Ausman of Paynesville is spending the present year in Vienna, where he is engaged in postgraduate work.

Dr. L. P. Adams has moved his practice from Sauk Rapids to St. Cloud, where he is associated with Dr. J. P. McDowell, who recently returned from Europe.

Dr. C. G. Nordin, formerly of Brainerd, has announced the opening of offices in the Lowry Building, St. Paul, where he is practicing his specialty, eye, ear, nose and throat work.

Dr. A. E. Comstock, St. Paul, was elected secretary of the State Board of Medical Examiners in April to fill the vacancy due to the death of Dr. Thomas McDavitt. The office of the secretary has been moved to 636 Lowry Bldg., St. Paul, Minn.

Summer courses at the University are scheduled to begin June 21 to July 31. Twelve University departments will offer studies during the summer, the medical school being among the number. Last year there were some 4,200 students enrolled in the two summer sessions in the various departments.

Dr. George E. Fahr, Minneapolis, was elected president of the Minnesota Pathological Society at the annual meeting held May 11 at the Institute of Anatomy, University of Minnesota. Other officers elected are: Vice president, Dr. Wallace Cole, St. Paul; secretary-treasurer, Dr. E. T. Bell, Minneapolis. Dr. A. H. Pedersen of St. Paul was elected councilor to succeed himself. Dr. F. W. Schlutz, Minneapolis, and Dr. A. R. Hall, St. Paul, were also elected to the Council.

Paul W. Farr, twenty-two years old, the son of Dr. and Mrs. Robert Emmett Farr of Minneapolis, died May 11 of heart failure, while swimming with a group of friends in Cedar Lake, Minneapolis. A graduate of St. Thomas Academy, St. Paul, where he played football, and a member of his class crew at Harvard, where he spent two years, Paul Farr was studying medicine at the University preparatory to following in his father's footsteps. The sympathy of many friends goes out to Dr. and Mrs. Farr in their bereavement.

SMALLPOX IN CALIFORNIA AND FLORIDA

From January 2 to February 20, 1926, there were 964 cases of smallpox and 86 deaths reported to the California State Board of Health. According to their weekly bulletin for February 27 the board has issued a warning that the disease is of the virulent type and has urged general vaccination.

In Florida, 517 cases of smallpox were reported in the State between December 1, 1925, and February 6, and more than 150,000 persons have been vaccinated, according to the *Journal of the American Medical Association* for March 6. The type of the disease is not stated.

With many people returning from these two winter resorts there is a probability that the disease may gain a foothold in New York State.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

EASTMAN KODAK CO.:
- Tetrabromophenolphthalein Sodium Salt-Eastman
- Tetraiodophenolphthalein Sodium Salt-Eastman

LEDERLE ANTITOXIN LABORATORIES:
- Scarlet Fever Streptococcus Toxin for the Dick Test-Lederle

H. K. MULFORD CO.:
- Pituitary Body Anterior Lobe Desiccated-Mulford
  - Tablets Pituitary Body Anterior Lobe Desiccated-Mulford, 2½ grains
  - Tablets Pituitary Body Anterior Lobe Desiccated-Mulford, 5 grains
- Scarlet Fever Streptococcus Antitoxin (Concentrated)
- Sterile Solution of Anterior Lobe Pituitary Extract-Mulford
  - Ampules Sterile Solution of Anterior Lobe Pituitary Extract-Mulford, 1 c.c.

PARKE, DAVIS & CO.:
- Corpora Lutea Soluble Extract-P. D. & Co.
  - Ampules Corpora Lutea Soluble Extract-P. D. & Co., 1 c.c.

SWAN-MYERS CO.:
- Ampules Dextrose 50 per cent, 50 c.c.-Swan-Myers

WILSON LABORATORIES:
- Pituitary Solution U.S.P.X Obstetrical
  - Ampules Pituitary Solution U.S.P.X Obstetrical-Wilson, 0.5 c.c.
  - Ampules Pituitary Solution U.S.P.X Obstetrical-Wilson, 1 c.c.
- Pituitary Solution Surgical
  - Ampules Pituitary Solution Surgical-Wilson, 1 c.c.

TRUTH ABOUT MEDICINE

Mead's Powdered Lactic Acid Milk (Cultured). — A modified milk product prepared by fermenting whole milk with *B. acidi-lactici*, drying and powdering. Each 100 gm. contains approximately protein, 29 gm.; carbohydrate, 26.4 gm.; fat, 28.8 gm.; free lactic acid, 3 gm.; and ash, 6 gm. This preparation is proposed for overcoming the so-called buffer action of cow's milk in the infant's stomach. Mead, Johnson & Co., Evansville, Ind.

Mead's Powdered Lactic Acid Milk (Acidified With Lactic Acid U.S.P.).—A modified milk product prepared by adding lactic acid U.S.P. to whole milk, drying and powdering. Each 100 gm. contains approximately: protein, 26.4 gm.; carbohydrates, 34 gm.; free lactic acid, 3 gm.; fat, 24 gm.; and ash, 6 gm. This preparation is proposed for overcoming the so-called buffer action of cow's milk in the infant stomach. Mead, Johnson & Co., Evansville, Ind.

Pollen Extracts-Mulford.—In addition to the products listed in New and Non-official Remedies and Jour. A. M. A.,

June 6, 1925, p. 1734, the following are also marketed as fourth series in five glass syringes (doses 16 to 20, inclusive) each containing 1,000 protein units: Lamb's Quarters Pollen Extract-Mulford; Ragweed Pollen Extract (Fall)-Mulford: Timothy Pollen Extract (Spring)-Mulford; Wormwood Pollen Extract-Mulford. H. K. Mulford Co., Philadelphia.

Concentrated Pollen Extracts-Swan-Myers.—(See Jour. A. M. A., May 30, 1925, p. 1634; Jan. 23, 1926, p. 277; Feb. 27, 1926, p. 625). These are marketed in 2 c.c. vials and in sets of five capillary tubes for diagnostic tests, each tube containing sufficient extract for one test. Swan-Myers Co., Indianapolis, Ind.

Scarlet Fever Streptococcus Antitoxin-Squibb.— (Jour. A. M. A., Jan. 16, 1926, p. 199). This product is also marketed in packages of 1 c.c. vials for the diagnostic blanching test containing sufficient toxin for ten tests. E. R. Squibb & Sons (Jour. A. M. A., Apr. 10, 1926, p. 1131).

Typhoid-Paratyphoid Prophylactic-Cutter. — A typhoid vaccine (New and Non-official Remedies, 1925, p. 360) marketed in packages of three vials; in packages of one 20 c.c. vial; and in packages of one syringe containing a mixture of typhoid bacilli and paratyphoid bacilli types A and B. Cutter Laboratory, Berkeley, Cal.

Parke, Davis & Co.'s Standardized Cod Liver Oil.—It has a content of fat-soluble vitamin A which is not less than 440 units per gm. and an antirachitic potency of not less than 59 units per gm. Parke, Davis & Co., Detroit.

Pituitary Solution U.S.P.X-Wilson.—An extract of the posterior lobe of the pituitary body of cattle, preserved by the addition of chlorbutanol. It is standardized to have the strength of solution of pituitary U.S.P. For a discussion of the actions, uses and dosages, see Pituitary Gland, New and Non-official Remedies, 1925, p. 260. The product is marketed in 0.5 and 1 c.c. ampules. Wilson Laboratories, Chicago.

Scarlet Fever Streptococcus Toxin for the Dick Test-Lederle.—It is prepared by growing the scarlet fever streptococcus in broth (see Diphtheria Immunity Test, Jour. A. M. A., Jan. 16, 1926, p. 199). It is marketed in packages of one vial containing diluted toxin sufficient for ten tests; in packages of one vial containing concentrated toxin sufficient for 100 tests and a vial of diluent. Lederle Antitoxin Laboratories, New York.

Scarlet Fever Streptococcus Toxin-Lederle.—It is prepared by growing the scarlet fever streptococcus in broth (see Scarlet Fever Immunity Test, Jour. A. M. A., Jan. 16, 1926, p. 199). It is marketed in packages of four vials of diluted toxin containing, respectively, 500, 1,000, 2,500 and 5,000 skin test doses; in packages of four 20 c.c. vials of diluted toxin containing, respectively, 500, 1,000, 2,500 and 5,000 skin test doses per c.c.; in packages of forty vials of diluted toxin providing ten immunizations. Lederle Antitoxin Laboratories, New York.

Ampules Dextrose 50 Per Cent, 50 c.c.—Each ampule contains 50 c.c. of a fifty per cent solution of dextrose U.S.P. Swan-Myers Co., Indianapolis. (Jour. A. M. A., April 17, 1926, p. 1213.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of March 10, 1926

The Minnesota Academy of Medicine held its regular monthly meeting at the Town and Country Club on Wednesday evening, March 10, 1926, at 8 P. M. Dinner was served at 7 P. M. There were 39 members and 3 visitors present.

The meeting was called to order by Dr. A. S. Hamilton in the absence of the President and Vice President.

The minutes of the February meeting were read and approved.

DR. H. A. H. BOUMAN (Minneapolis) reported two cases as follows:

Case 1. Two very large "loose bodies" of the knee joint. A farmer, 62 years old, was referred because he had attacks of sudden stiffness of his right knee during the past two years. His rheumatism was growing worse and the knee felt insecure, and it was larger than the other knee.

There was nothing in the family history of any import. He had always been well except at the age of 21, when he stil lived in Sweden, he had been seized more or less suddenly with severe pain in the upper 5 inches of his right tibia. The pain had been of such a character that he could never forget it. After two weeks of suffering, a doctor had been called who had him removed to a hospital, where his leg had been opened. He remained at the hospital for six months. The wound drained continuously, pieces of bone coming out at different times. After he got home the condition continued for another three months, when the wound closed. He has been free from trouble up to two years ago.

Present status: The man is in good health. His right knee is large, containing several large-sized bodies in the anterior pouches. These were removed under local anesthesia at St. Andrew's Hospital.

The points of interest are: their large size, and their structure. Growing from the nutrient substances contained in the synovia, they clearly show the outer fibrocartilage layer and the calcified inner one, surrounding a hollow space.

Case 2. Grawitz Tumor of the Left Kidney. (Specimens and slides were shown.) This woman was seen first on January 15, 1924. Her family history was good. She was 49 years old, married, in good health previously, had four children, and was still menstruating normally. At the end of November, 1923, she was in an automobile accident when the car ran into a ditch. Since then she had had severe pain at menstruation. The hips had been sore before, but now the left one had become very painful, especially in the morning. This condition continuing, she entered Northwestern Hospital for diagnosis.

She proved negative on examination, except that the uterus was too large, and the left upper horn was exquisitely tender. There was cystocele. The Wassermann was negative. Cystoscopy revealed normal urine from both sides, separately obtained. A pyelogram was not made.

After several consultations she was operated. A small fibroma was removed from the left uterine ostium. A heavy band of adhesion, passing from the sigmoid to the right round ligament and bladder, was removed. There was evi-

dence of extensive old peritonitis about the sigmoid; no diverticula. Ventrofixation was performed and the perineum repaired.

She was apparently well and free from pain at menstrual periods and otherwise, until February 11, 1926, when she had rather severe pain in the left side of the abdomen along the ureter, but without intestinal symptoms, bladder disturbance, or fever. There was little relief, and she entered St. Andrew's Hospital February 13, 1926. *X*-ray films were taken, which showed the right kidney normal, the left kidney pelvis 7 inches long and distorted extending far outward under the 11th rib. The urine, taken separately from the ureters, was twice negative. The bowel outline was normal. Her appetite was fair, and she was negative generally, except for the persistent and severe abdominal pain which was distinctly left-sided, and a large irregular tumor, inelastic, tender at its middle, situated under the left costal border and protruding slightly, could be felt along the vertebral column. This did not move with respiration and seemed fixed.

The probable diagnosis was hypernephroma, in spite of the fact that there was no hematuria.

Operation consisted of exposure by the lumbar route, with rib resection. The very large tumor was firmly adherent, and was dislodged from the diaphragmatic fossa with great difficulty. Following a division with the finger, this tumor was clamped. The ureter was identified and properly cared for. The vessels at the outer and upper corner of a sausage-like remaining mass were separated and doubly tied. There was a great deal of a yellowish, very greasy matter oozing from cyst-like pockets. We emptied several such pockets with smooth walls, attempting, with due caution, to remove as much as possible. The rounded rest tumor was about 4 inches long and 2 inches thick and was fixed along the vertebræ, the beating aorta passing in its mesial border. There was no bleeding.

About this time the anesthetist gave a warning. We had come to a tube-like pocket and the finger entered a smooth tube passing across the beating aorta and the vertebral body. While the structure was held, the assistant passed a catheter, which disappeared easily. A very large clot followed its withdrawal and a flow of dark blood. The vein was immediately well secured and sewn carefully. There was astonishingly little blood. The vessel was an inch wide. The catheter passed across the vertebra to the right side and then down, with perplexing ease.

The patient recovered rather promptly from what appeared to be a hopeless condition, and is doing well at the present time. Radium will be applied in a few days.

Hematuria is absent in 25 per cent of these cases. The relief from pain following the first operation may have been a natural remission. There was an absence of appreciable metastases.

DISCUSSION

DR. A. SCHWYZER: I remember just one case where we damaged a very large vein in this neighborhood. It was a case of carcinoma of the transverse colon. The case was almost inoperable, but it still seemed more or less movable though the carcinoma had grown toward the root of the mesocolon. The mesentery was quite fleshy there and we put on a clamp and cut above the clamp. The clamp slipped a little and in a moment there was a flooding with blood. We, of course, compressed at once, but in that short space of time there was about 10 ounces of blood lost. We had cut away a slice of the superior mesenteric vein. It was sewed laterally with fine running silk. The case terminated successfully. It showed the fierceness of the bleeding when we get into the large veins of the abdomen. That was in the big part of the superior mesenteric vein. These veins bled from both sides and the bleeding is much worse than from a good-sized artery, which has firmer walls and can therefore be handled more energetically without fear of further tearing.

These hypernephromata seem to have the quality of growing at times into the veins. This is also true of malignancy in another organ, and that is malignant goiter. In different forms of adenocarcinoma of the goiter, the tumor is liable to grow into a vein and you are liable to feel the thick cord of a vein where the neoplasm has entered.

DR. M. S. HENDERSON (Rochester) read a paper entitled, "Ununited Fractures of the Neck of the Femur." Lantern slides were shown.

DISCUSSION

DR. COLE: This study of Dr. Henderson's is very interesting and illustrates one thing which I believe Dr. Henderson touched upon but did not emphasize. There seems to be no doubt that the number of ununited fractures of the neck of the femur is decreasing throughout the country, and undoubtedly this is due to the more general use of the Whitman abduction method in the acute cases. The one other point which I think was brought out by the statistics is that the mortality in the unoperated cases and in the operated cases is about the same. There are, therefore, undoubtedly certain acute cases where operative measures are indicated in order to hurry union and make sure of good position. The choice of operation, such as whether live bone or beef bone pegs should be used, is probably unimportant.

DR. CHATTERTON: I wish to emphasize only the diagnosis. The cause of many admittedly poor results is due to the fact that a true diagnosis has not been made and, if made, only meager treatment instituted. The time element was not sufficiently considered. It requires at least four months without weight-bearing to secure union, and six months in the greater number of cases; while many cases of ununited fractures give the history of only two months' treatment. Complications demanding frequent change of position in the patient are often the cause of non-union. Poor results with good treatment, because of poor physical condition of the patient, are not infrequent.

Another cause of ununited fracture is the fact that no real treatment was instituted, especially in old people where the diagnosis was not made.

Dr. Bradford brought out the idea that the presence of synovia between the fragments of bone was the frequent cause of non-union.

DR. SMILEY BLANTON (Minneapolis) read a paper entitled, "Some New Applications of the Principles of Psychological Medicine."

DISCUSSION

DR. W. A. JONES: It is very difficult to add to what Dr. Blanton has already said except that one may have

some very strong convictions that we behave and act as we do because we are inherently built that way. I am persuaded, too, that environment has a good deal to do with our behavior, but, compared with heredity, it has less. A great many children grow up mischievous, perhaps overzealous and over-active, but when the opportunity presents itself they suddenly emerge into a full-grown adult or even into young manhood and perform as a human being should perform. I presume it is due to something in them that has not been brought out until a special crisis in their life has been reached or some special environment has been presented. It is sometimes almost impossible to analyze the family satisfactorily and the first analysis, of course, should be of the parents and grandparents before we can determine very much about the future of the child.

Dr. Blanton has cited an extreme case of behavior not only of the children but of the family, and undoubtedly if this family had been separated much improvement might have taken place in the children, or if the family occupied a different atmosphere their relationships might be entirely different.

I still think that the old-fashioned way of bringing up some children is much more satisfactory than the new way. A good sound spanking occasionally, with the proper explanation of why it is done, is a great deal better than psycho-analyzing the child, its behavior, and its surroundings. Of course, with defective children this takes on another aspect, because they are primarily physiologically, anatomically, or chemically bad and they have to be cared for as any young small animal is looked after.

I have a woman under my observation who is now about thirty-five years old and who seemed like a mild, inoffensive, pleasant sort of person. She married a man twelve years ago and has had two children by him. She said the night she married this man she hated him and had hated him ever afterward. This was her starting point, and both of them evidently had started wrong; he was the aggressor and she was the innocent. She is a typical neuropsychiatric case, full of emotions, frequently uncontrollable, and easily tired out. Each spring she has had a period of three or four months in which she was partially incapacitated. Yet her two children are smart, bright, and physically well. Will they grow into something equally promising or will they develop some of their mother's tendencies later in their young adult life? Sometimes the unexpected turns in life will bring out all the fine resources that they possess, and on the other hand we know so little about what heredity and environment will do that the question is a very difficult one to solve as to behavior.

It is presumed that most of the men here have read books on heredity and environment and are familiar with the book written by Dr. Dorsey, an anthropologist of Chicago, entitled, "Why We Behave Like Human Beings." This book is not as satisfactory as many of the others because it is fragmentary and condemnatory in that he believes that most of the other books which have materialized in the past few years are utterly useless and he has frankly stated that most of them are "bunk." But it seems to me that his own book is just as unsatisfactory as he claims the others are. He is rather discouraging in his outlook, too, as to the future of the individual; but believing as we do now in the individual and his own inherent characteristics and his environment, whether satisfactory or unsatisfactory, he is little likely to change from what he is predestined to do. I confess that I am very skeptical about the future of the race myself. I may be more or less stubborn in the matter, but it seems to me that 90 to 95 per cent of us (and I claim to be of that percentage) are more or less feebleminded; that includes its widest meaning, from the lowest to the highest. How are we going to improve the mental status?

DR. SCHLUTZ: The subject Dr. Blanton has discussed is an important one in Pediatrics. Those who have been in active practice certainly realize that. The greatest difficulty I have always found was not so much the control of any factor of disability or defect due to actual disease, but rather the correction and control of environmental and social factors. We had no good mechanism to analyze or successfully treat behavior and child guidance problems. The most successful result was generally obtained if the child was entirely separated from its immediate environment, and this was generally done in difficult cases. Amazing results can be accomplished by the type of analysis and therapy described by Dr. Blanton.

I agree with Dr. Jones that a whipping is often a good thing, but it must be intelligently applied. I had a stern father who would give me a good licking with a sapling I had to cut myself, and would then demand that I thank him for it. I know now, of course, that he meant well, but do recall the anger and indignation I experienced when he made this demand.

Dr. Jones' outlook for the human race as regards mental capacities is rather pessimistic and is, I hope, not quite true. I agree so heartily with Dr. Blanton in his estimation of Freud and his theories.

DR. CHRISTISON: This has been intensely interesting to me. However, I can't altogether agree with our pessimistic friend. I never had a whipping at home and during all my school career I had but one teacher who ever undertook to whip me and she only tried it once.

When one undertakes a study of the psychology of childhood, the first thing to do is to put oneself in the other fellow's place. I am connected with the Children's Division of the United Charities in St. Paul, and a large part of our work is the placement of children, taking them out of bad homes and putting them into "foster homes," where we have a general supervision of them. Many of these cases come to us from the courts. When one looks into their home conditions they are sometimes so deplorable that you often wonder why the child is not worse. Many of these children are amenable to reason. If you are kind to them and they are properly fed and told to do the thing that is right because it is the proper thing for them to do and not because they fear punishment, you get along very well with them.

If we could appreciate what the mind of a child really is and how it acts and what they think about the actions of their parents and elders, we might get considerable enlightenment.

I have come to the conclusion that the majority of children are like their mothers, you can lead them anywhere you want to but you can't drive them an inch.

DR. HERBERT JONES: It seems to me this subject is more important than the interest it gets. From Dr. Blanton's

paper dealing with the various phases, you can see what the study of behavior in children leads to. It takes us into almost every field—home, school, business, and religion. This work is so new the nomenclature has not been fully worked out. It seems to me that the world is in a rather peculiar psychological state just now as evidenced by the popular fads and fancies.

However, I think the children in the Northwest were never taken care of so well physically as they have been in the last twenty-five years or since the advent of Dr. Sedgwick. If you will look back at the way children were taken care of twenty-five years ago you can see there is a big improvement at the present time. I recall that in the early textbooks it was taught that one of the stigmata of nervous degeneration was the high-arched palate. A lot of nervous neurotic people were of that type. The orthodontists now correct that condition in childhood and you don't have nervous people from that cause. If we can do as much for the psychological condition in the next twenty-five years, it will be a wonderful improvement and the outlook for this was never so good as it is at present.

Dr. Blanton (in closing): Dr. Sweetser asks about the Mendelian law. I can perhaps best answer his question by quoting the following passage from Dr. Jennings. Dr. Jennings is one of the leading biologists in America today. He says (from "Heredity and Environment," by H. S. Jennings):

"Not only what the cell within the body shall become, but what the organism as a whole shall become, is determined not alone by the hereditary materials it contains, but also by the conditions under which these materials operate. Under diverse conditions the same set of genes will produce very diverse results. It is not true that a given set of genes must produce just one set of characters and no other. It is not true that because an individual inherits the basis for a set of characteristics that he must have those characteristics. In other words, it is not necessary to have a certain characteristic merely because one inherits it. It is not true that what an organism shall become is determined, foreordained, when he gets his supply of chemicals or genes in the germ cell, as the popular writers on eugenics would have us believe. The same set of genes may produce many different results, depending on the conditions under which it operates. True it is that there are limits to this; that from one set of genes under a given environment may come a result that no environment can produce from another set. But this is a matter of limitation, not of fixed and final determination; it leaves open many alternative paths. Every individual has many sets of 'innate' or 'hereditary' characters; the conditions under which he develops determine which set he shall bring forth. So in man, the characteristics of an educated, cultured person are as much his inherited characteristics as are any that he has. * * *

"Beyond all other organisms, man is characterized by the possession of many sets of inherited characteristics; the decision as to which shall be produced depending on the environment. The axolotl may be compared to an uneducated man, the amblystoma to an educated one. The educated man has characteristics very diverse from those he would possess if uneducated. We say, when we think of his fact, that these are acquired characters, environmental characters, due to education. This is correct; but there is a tendency to go farther and say that these are not inherited characters, which is a mistake. The characteristics of the educated man are his native inherited characters, just as truly as are any that he has. For all his characteristics depend on the conditions under which he develops, and would be diverse under different conditions, just as is true of the characteristics that develop under education. And the characters developed under education depend upon the hereditary materials derived from his parents, changing as these materials are altered, just as do all others. 'Hereditary' has no consistent meaning other than this."

The general opinion among biologists at present seems to be that among human beings nothing else is inherited according to the Mendelian law except eye color and hair color. Of course, we do inherit physical characteristics from our parents, but the law of this inheritance is not quite clear.

One of the members of the Society just asked, "What is normal?" and "What is right and wrong?" Our idea of what is normal and what is right and wrong is constantly changing. In general, the psychiatrist takes the prevailing standards, the social concept of the community he is in, in deciding what is right and wrong. Things that we thought were abnormal some time ago, we now recognize as within the limits of normality. At one time, masturbation was considered to be very abnormal, but we have since found that practically all children masturbate at one time or another, so this practice cannot be so very abnormal.

Dr. Jones seems to feel that much of the work of the psychiatrist with children is useless because children outgrow behavior difficulties. This is true. Children also outgrow many of their physical defects. But there is always a large enough percentage who do not outgrow their physical defects so that we feel that it is unwise to allow physical defects to remain untreated. Most children will outgrow rickets, but we take every precaution that we can to see that they do not develop rickets. We may say the same thing about behavior difficulties. Children may outgrow them, but a certain percentage do not outgrow their behavior difficulties. They grow up with rickety minds—timid, fearful, moody, inhibited, unsuccessful people.

The laws of discipline are not easy to formulate. The first thing that we must do is to study man with the same scientific detachment that we do the other facts of life. From this sudy, we are led to the conclusion that the bebehavior of people is symptomatic of some underlying cause. It is only when we are able to find out the cause that we are able to modify behavior. We must think of behavior in the same way that we think of physical symptoms. If a child has a pain, we try to find out the cause of it. If he has a temper tantrum, we must not treat the temper tantrum; we must try to find out the cause.

In disciplining children, we have three methods before us. We can give them acute physical pain, acute psychological pain, or prolonged psychological pain. This is the negative side. On the positive side, we can reward them.

John E. Hynes, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:
DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

THE TREATMENT OF TRAUMATIC RUPTURE OF THE KIDNEY: Miler B. Wesson (Annals of Surgery, 83:2, p. 246). Traumatic rupture of the kidney is not a rare lesion, although its treatment in the textbooks would indicate that it was very uncommon. Galen, in 1561, described subcutaneous rupture of the kidney. Since Rayer's classical work in 1839 the literature has become voluminous. Some writers have collected as many as 900 cases, and all of the tabulations are incomplete.

The subject of treatment has always been controversial, there being ardent advocates of each of the three types of treatment: expectant, conservative surgical, and nephrectomy. With the advent of the workmen's compensation insurance, other factors than pure science have complicated the problem.

Etiology. After a careful review of the literature, one is amazed at the frequency of kidney ruptures that follow inadequate force. The commonest modes of injury are (1) a blow driving the kidney against the lower ribs or transverse processes, (2) concussion, and (3) abrupt flexion of the body. Infection plays a very important part in the etiology of cases of non-traumatic rupture, but is of little causative significance in cases due to external violence.

Pathology. Tuffier classifies ruptures as (1) ecchymosis, (2) subcapsular and (3) total rupture. Urine in the cellular tissue indicates a torn pelvis or ruptured calyx, since torn renal tissue is not capable of secreting urine.

Hemorrhage can be classified in four groups: (1) hematuria, (2) perirenal, (3) intrarenal, and (4) intraperitoneal. The renal artery is sometimes torn off and stops bleeding, thrombosis occurring while there is a balance of pressure between the blood clots behind the peritoneum and the blood pressure within the artery. A large hemorrhage into the peritoneal cavity is fatal because of the lack of counter-pressure. Hematuria is generally absent because of clots in the ureter and shock is the only symptom.

Symptoms. The regulation train of events is, a fall, "felt sick," hematuria, dysuria, and shock.

Hematuria is the most characteristic symptom and is present in from 90 to 95 per cent of the cases. It is absent if the ureter is severed or if the bleeding is intraperitoneal.

Shock that comes on after several hours is due to hemorrhage, but coming on at once is due to an injury to the solar plexus.

Reflex anuria is not uncommon and may be fatal.

Pain. The nerves of a kidney are in the pelvis and not in the cortex, hence there can be no pain unless there is a pull on the renal pedicle or intrapelvic back pressure.

Treatment has not been standardized. The common procedures are, (1) expectant treatment, where constitutional symptoms are absent and hematuria alone directs attention to the probability of a kidney lesion; (2) conservative surgery (tampon, suture, etc.) for a damaged kidney with a torn capsule; (3) nephrectomy for a destroyed kidney; and (4) abdominal incision for a torn peritoneum.

The indications for an exploration are, (1) immediate severe hemorrhage, (2) steady hourly rise in pulse rate, and (3) anemia due to moderate hemorrhage over many days.

Some of the recognized indications for nephrectomy are, (1) tearing of the renal pedicle, (2) multiple lacerations of the kidney, (3) a tear extending toward the renal pelvis which is inaccessible for repair, (4) a complete tear across the ureter, and (5) hydronephrosis or other severe disease of the injured kidney.

Aside from hemorrhage, there is no other justification for operation except infection. Hematuria, in itself, is not an indication for operation.[1] Instrumentation is to be avoided when possible because of the danger of infection. Large quantities of blood in the bladder require aspiration with a clot-sucker.

The author discusses prognosis. He deplores the tendency to do a nephrectomy when expectant treatment or conservative surgery are possible. He concludes that of all the internal catastrophes, a ruptured kidney treated under modern conditions offers the best prospect for a complete recovery.

Five case reports are given and discussed.

H. E. SIMON, M.D.

[1] Since hematomata are easily infected, faithful supervision of the case is absolutely necessary if conservatism is attempted.

PYLEPHLEBITIS AND LIVER ABSCESS FOLLOWING APPENDICITIS: E. L. Eliason, M.D. (S. G. & O., Vol. xlii, April, 1926, No. 4, pp. 510-522). The author reviews the literature on pylephlebitis and liver abscess following appendicitis. Various investigators give different figures for the incidence. The author gives it as from 0.1 to 0.4 per cent.

The signs and symptoms of this complication are as follows: Septic type of temperature coming on frequently after two to four days of normal convalescence accompanied by chills. Leukocytosis is high, ranging from 10,000 to 29,000. Pain is not constant; when present is in right upper quadrant and is of a pleuritic character. Jaundice is almost invariably present, although at times it is very slight. Tenderness over site of abscess or pylephlebitis is always present. Edema localized over region of lower ribs in midaxillary line is almost an invariable finding. The author considers it almost pathognomonic when associated

with preceding signs and symptoms. Nausea, vomiting, anorexia, lassitude, and emaciation are frequent symptoms. The *x*-ray aids to rule out pneumonia and usually shows an elevated fixed diaphragm; the findings are practically those of a subdiaphragmatic abscess. Urobilin is frequently found in urine. In fifty-eight of the cases abscess is single. Mortality is about fifty-four per cent, when cases are properly treated. Diagnosis is rarely made early, varying from two weeks to eleven months.

Treatment is surgical, usually drainage through the diaphragm, but also by abdominal route. The author gives the histories of fourteen cases. His conclusions are as follows:

1. Pylephlebitis and liver abscess are not identical and occur as a complication in from 0.1 to 0.4 per cent of cases of appendicitis.
2. *X*-ray and fluoroscope aid in early diagnosis by showing a high diaphragm, sometimes with restricted motion.
3. Local edema and prominent veins are valuable diagnostic signs.
4. Pain is not always present. It is noticed most when the infection is in or on the upper surface of the liver.
5. Pneumonic signs are frequently the result of lung compression, rather than pneumonia.
6. Jaundice is practically a constant symptom.
7. The presence of lassitude and anorexia is very suggestive in the diagnosis.
8. The prognosis is not universally bad, as 54 per cent recover.
9. Operation through the diaphragm is the treatment of choice.

P. G. Flothow, M.D.

APPENDICITIS IN INFANCY AND CHILDHOOD: Stanley J. Seeger (Surg., Gyn. & Obst., 42, 4, pp. 536-539). The author reports 61 operations for appendicitis in children, with a mortality of 8.2 per cent. All series show a rarity of appendicitis under the age of 2 years, reasons advanced being liquid diet, frequency of bowel movement, and the supine position.

Acute appendicitis occurs twice as frequently among male children as among females. In early childhood the symptoms are somewhat obscured. The pain is likely to occur early, in the region of the umbilicus, and later, as the peritoneal coats become involved, it shifts to the region of the appendix. Constipation is a fairly constant finding, and in children under four the presence of diarrhea is much against a diagnosis of appendicitis.

The average admission temperature for all cases was 101, and the average leucocyte count was 17,500, with a maximum of 25,100 in unruptured appendices, and 39,600 in ruptured cases.

Fixation of the abdomen during respiration is a striking sign when peritonitis is present. Because of the shallow pelvis in the child, rectal examination is of more value than in the adult. In the series, 59 per cent were ruptured, 18 per cent rupturing in the first 48 hours.

In infants, the omentum is a short, transparent structure, plainly not involved in the localization of infection. The peritoneum, also, is much less resistant to infection than is that of the adult. Operation is the treatment of choice in all but the very late cases. The McBurney incision was employed in all because it is time-saving and reduces intra-peritoneal manipulation. One of the most important post-operative complications is intestinal obstruction, which should be treated promptly, the suturing of a catheter into a loop of distended bowel often being all that is necessary.

H. E. Simon, M.D.

THE VALUE OF PERITONEAL SHEETS OF COALESCENCE IN ABDOMINAL SURGERY: Gutierrez (S. G. & O., Vol. xlii, April, 1926, No. 4, pp. 469-473). The peritoneal sheets of coalescence are remarkably serviceable in abdominal surgery. It is through their utilization that certain fixed segments of the digestive tract may be made movable.

Intestinal mobilization represents the preliminary and fundamental element in every surgical intervention on an intestinal segment that has become secondarily fixed by coalescence.

The embryology of the alimentary canal is reviewed in this article and the rotation of the primitive canal is explained. In the embryo practically the entire alimentary canal is mobile with its primitive mesentery. In the process of rotation whenever visceral peritoneum meets parietal peritoneum there is coalescence which results in immobilization of the several portions of the alimentary tract.

All blood vessels and nerves are contained in the original primitive mesentery so that the areas of coalescence offer sites for freeing fixed portions which are bloodless, and in doing this the blood and nerve supply of the mobilized portion is not encroached upon.

The author gives the methods of mobilizing the duodenum, ascending and descending colon, pancreas, and spleen when it is immobile. He applies these principles to practical abdominal surgery and shows that it aids very much in operations on the fixed portions of the colon, the pylorus and duodenum, internal hernias, retrocecal appendix, renal and retroperitoneal tumors, spleen and pancreas, and in gastric surgery, especially gastroenterostomies.

P. G. Flothow, M.D.

CONGENITAL DISLOCATION OF THE HIP: Vittorio Putti (Surg., Gyn. & Obst., 1926, 42, 4 pp., 449-452). One thousand eight hundred and seventy-nine cases are reported, in 10 per cent of which there was a family history of congenital dislocation of the hip. More than 84 per cent occurred in females, and in 39 per cent the deformity was bilateral. A curious geographical distribution was noted, a much greater frequency in the northern provinces of Italy than in the southern.

In the majority of instances the theory of mechanical origin offers the best explanation for its occurrence. According to this, the deformity is the result of chronic trauma to which the lower limbs are exposed in the second half of prenatal life. The flexion and external rotation of the legs, the lack of proportion which physiologically exists between the femoral head and the socket, the softness of the border of the socket, the physiological anteversion of the neck of the femur, all being favorable conditions

for an incipient dislocation, which becomes more evident later as the joint has to carry the weight of the body.

Diagnosis. — The typical waddling gait is sufficient to make one suspect a dislocation, and the diagnosis may be confirmed by the *x*-ray. However, it is of the greatest importance to recognize the dislocation before the patient begins to walk. If the dislocation be unilateral, the cutaneous creases of the thigh are not symmetrical, being more proximal on the dislocated side, and the inguinal and gluteal pleats are longer and deeper. The outline of the hip on that side is more prominent and the limb tends toward external rotation, and abduction is diminished. In bilateral cases, the pelvis appears enlarged, the buttocks flattened and the limbs cannot be normally abducted.

The treatment employed by the author is that of Paci and Lorenz, although open operation is resorted to when the other methods fail. After the age of 4 years in bilateral cases and 7 in unilateral cases, the indication for surgery is not so definite and any one of numerous methods may be indicated to suit the case.

Functional and anatomical success was obtained in 80 per cent of unilateral, and in 65 per cent of the bilateral cases.

H. E. Simon, M.D.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

INTRAPERITONEAL TRANSFUSION IN INFANTS AND YOUNG CHILDREN AND ITS USE IN CONJUNCTION WITH INTRAPERITONEAL SALINE SOLUTION: Oliver W. Hill, M.D., Joe T. Smith, M.D., and Wm. R. Cross, M.D. (Archives of Pediatrics, March, 1926). Blood transfusion in infants and children is of long recognized therapeutic value. In any successful transfusion the authors would expect an increase in the blood elements within the vessels, a certain nutritional value, a hematopoietic stimulant, the supplying of certain anti-bodies as well as a general metabolic stimulant. That the intraperitoneal route will furnish the above in an available form seems to be proven conclusively by animal experimentation as well as by clinical evidence.

The authors have successfully combined intraperitoneal transfusion with intraperitoneal saline in a number of cases in which a definite increase in body fluids was indicated, as well as the stimulating and other effects of a transfusion.

Intraperitoneal transfusion is easily and harmlessly administered and is a valuable therapeutic adjunct in certain cases. This method of blood transfusion can be simply and efficiently combined with the intraperitoneal injection of normal saline when indicated.

R. N. Andrews, M.D.

AN ANALYSIS OF SIXTY CASES OF DRUG POISONING: L. M. Murray, B.A., M.B. (Archives of Pediatrics, March, 1926). During a period of six years, 1919-1924, inclusive, there were 60 cases of drug poisoning admitted to the Hospital for Sick Children, Toronto. Two-thirds of the total number in children are under 5 years and almost one-half of the total number under 2 years, whereas a smaller fraction, namely, one-sixth, were under one year.

It will be seen that one-fourth of the cases and nearly one-half of the deaths were due to strychnine poisoning, all of which resulted from small children gaining access to a bottle of A. B. S. & C. pills. The five cases of atropine poisoning were due to parents giving overdoses of atropine sulphate, in the treatment of enuresis.

One fatality, out of a total of three cases, resulted from the aspiration and ingestion of zinc stearate powder. The remaining three deaths occurred from the accidental ingestion of oil of wintergreen and toothache drops, respectively, and one of the six cases of gas poisoning resulted fatally.

The great majority of such cases could be prevented by the exercise of reasonable care on the part of the parents. It is perhaps of interest to mention four cases of resorcin poisoning. These were all cases of infantile eczema, treated in hospital by the application of a seven per cent resorcin ointment, with resulting collapse, apparently of a toxic nature due to absorption of resorcin. These cases were all treated by exsanguination and transfusion, with very gratifying results.

The use of phenacetin in small infants is to be avoided, if possible, as they do not tolerate it at all well.

Treatment.—The treatment employed, generally speaking, includes emetics, gastric lavage, and purgation, together with sedatives or stimulants as indicated. The success of treatment in this type of case depends upon the parents bringing the patient to hospital immediately, without waiting for the possible development of poisonous symptoms, and the immediate washing out of the stomach.

R. N. Andrews, M.D.

THE SIZE OF THE LIVER AND THE SPLEEN IN APPARENTLY NORMAL CHILDREN: Harry O. Zamkin, M.D. (Archives of Pediatrics, March, 1926). To summarize the author's observation on the liver, it may be noted that: (1) the liver in apparently normal infants and children has been found to vary in size from just palpable to 6.5 cm. below the costal margin in the mid-clavicular line; (2) the liver is commonly found 3.5 cm., 4.5 cm., and 5.5 cm. below the costal margin in the mid-clavicular line as late as nine years of age; (3) the liver is found fairly often as low as 3.5 cm. below the costal margin in the mid-clavicular line up to 12 years of age; (4) neither the state of nutrition nor the type of diet affected the height of the liver.

With regard to the size of the spleen in apparently normal infants and children, the author finds that: (1) the spleen was palpated below free border of ribs in 25 per cent of 2,100 normal infants and children; (2) the frequency with which they were palpated was greatest during the first year, where it was present in 41 per cent, and then became less frequent, going to 25 per cent in the group of 2 to 4 years,

18 per cent in those 5 to 9 years, and 10.6 per cent in the older children, 10 to 12 years; (3) only those cases of rickets that presented a marked Harrison's groove or a secondary anemia showed an enlarged spleen in as high as 69 per cent during the first year, and 72 per cent during the second year, so that rickets per se could not be characterized by a large spleen; (4) the type of feeding during the first year, whether the child did not receive the breast at all or for at least two months, and even six months, had no appreciable effect on the size of the spleen; (5) neither race nor nationality of parents showed an appreciable difference in the size of the spleen; (6) the presence of a large spleen was as a rule associated with a large liver.

It is just as important to give relatively as much time and attention to the examination of the abdomen for the size of the liver and spleen as is given to the heart and lungs.

Let us look for it in the normal child, and its presence in the sick child will not so often cause unnecessary alarm.

R. N. Andrews, M.D.

ACTINOTHERAPY IN PEDIATRICS: J. H. Gettinger, M.D. (Arch. of Ped., April, 1926). The biological effects of ultra-violet light are strongly pronounced when the human skin is exposed to its ray. The blood in the capillaries absorbs actinic rays. These rays have their effect upon lymph and blood channels. There is a photochemical action between the ultra-violet rays and the hemoglobin of the blood. This charging of the blood with radiant energy enables its elements to convey an increased amount of oxygen to the cells and an increased quantity of toxic gases away from the cells. The glandular tissue is also affected and its phagocytic power increased. In short, it activates the formation of antibodies.

The most valuable result of these rays is the hyperemia produced by a properly regulated dose, manifesting itself six to eight hours after exposure to the light. The hyperemia will remain for a period varying from three to ten days. The hyperemia produced by ultra-violet rays is the main effect of therapeutic beneficence. Patients who do not pigment well do not benefit so markedly under the treatment.

Some of the chemical changes that ultra-violet rays bring about in the blood are to increase its calcium content and also to increase the concentration content of inorganic phosphorus. In infectious conditions where the blood platelets were found to be diminished, ultra-violet radiation brought about a restoration of the normal number.

In malnutrition, the results have been marvelously gratifying, as it increases the oxygen-carrying capacity of the blood and arranges the hematologic elements so that the maximum opsonic index is assured, and, acting upon the sympathetic nervous system, co-ordinates the inter-relationship of the endocrine. In rickets, where there is not only a deficient blood content of calcium and phosphorus, but also a disproportion between the two salts, ultra-violet rays offer a possible solution. In cases of surgical tuberculosis, the results are almost miraculous.

R. N. Andrews, M.D.

THE USE OF MERCUROCHROME IN CHILDREN: Harry Lowenburg, M.D. (Arch. of Ped., April, 1926). The intravenous injection of substances for the control of infectious processes is employed for the same purposes and in the same manner in children as in adults with, of course, the exception as to the size and frequency of the dose. At present, judging from the author's experience and from a hurried survey of the literature, it is his feeling that the usefulness of these agents still remains to be proved, even granting their harmlessness, which, as he has seen, is by no means certain.

Those of us who too frequently stand dumb at the bedside of a stricken child, helpless to assist, are likely to add to the confusion by employing the substance in cases for which it is not suited and for which it was not intended or recommended by its inventor. Many of us, both laboratory workers and clinicians, are prone to draw hasty conclusions, to believe post hoc, propter hoc, and to give credit to a remedy for a recovery when that credit rightly should accrue to vis medicatrix naturæ.

It would perhaps be wise for great universities to establish a strict but honest censorship over the publication of all articles and papers which describe revolutionary methods or discoveries and which in particular claim new methods of cure. If this were done there would be less pain, fewer heartaches, less reactionism in medicine.

It is due the medical profession and the laity as well for Dr. Young to give us at the present time an article entitled, "The Truth About Mercurochrome and Gentian Violet," in which he will detail his failures as well as his good results,—as well as giving us any additional information he may have acquired from increased experience and give us the means of explaining our own failures or tell us frankly that his original claims were exaggerated.

R. N. Andrews, M.D.

A STUDY OF AN EPIDEMIC OF IMPETIGO IN NEWBORN INFANTS: Lloyd B. Dickey, M.D. (Archives of Pediatrics, March, 1926). From the data at hand it may be concluded that the incubation period in this series of impetigo cases was probably not more than two days. There is nothing to point to this epidemic as being an air-borne infection. The chance of transmission from internes and staff doctors, from nurses, and from mothers, is real, however.

Among the utensils in the nurseries found to be contaminated with staphylococci were the tray of the weighing scales, a supposedly sterile surface of a towel covering a tray, the bath-tank thermometer, the shade and bracket of an electric lamp hanging directly over the table where the infants are dressed, and the sink itself on which the infants are placed while being bathed. Dust from a drawer in a table on which the infants are dressed, and which contained articles such as safety pins and adhesive tape, was found contaminated with staphylococcus albus, which organism may at least be considered as an evidence of hand contamination.

The probability of the spread of the infection by means of the hands or persons of doctors, nurses, or others hav-

ing access to the nurseries, is certainly great. First remove the infant from the newborn nursery to an isolation ward. The blebs are then opened and cauterized with silver nitrate, and the infant placed in complete isolation with the usual precautions.

Daily bichloride and alcohol baths (1-2000) were begun on all babies, both those with and those without the infection. Whatever benefit might be derived from these measures as prophylactic against sporadic cases, it cannot be said in this case that they had much effect in controlling this epidemic.

The operating room training should be completed before the nurses are sent into the newborn nurseries. There should be as little communication as possible between the obstetrical wards, where babies are brought to nurse, and other contaminated wards. The borrowing of any materials or supplies by the obstetrical ward from other wards should be foregone. The use of boric acid solution may well be discontinued in newborn nurseries. It has no value as an antiseptic, and is difficult to keep from contamination.

Organisms isolated from materials in the nurseries and from blebs of patients will grow and remain alive in tap water, 4 per cent boric solution, albolene, and soap, for various periods of time.

Realization of the true method of spread, with proper precautions to prevent it, will result, the author thinks, in a greatly reduced incidence of infection.

R. N. Andrews, M.D.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

THE IMPERFECTIONS OF THE STEREOSCOPIC MANEUVER IN RADIOGRAPHY OF THE CHEST: Waring and Wasson (Radiology, vol. 6, p. 198, Mar., 1926). In the infant, one-half, and in the adult, two-thirds of the chest radiograph is obscured by the bony parts, the ribs and clavicles. A further obscuration occurs from the mediastinum. The head-foot or vertical tube shift best obviates the bony and diaphragmatic interference, while the lateral shift best obviates the interferenec of the mediastinum and bronchial tree.

The more parallel the ribs, as in early infancy and in senile and emphysematous chests, the more can be gained by the stereoscopic maneuver using the head-foot shift. In spite of the shift many parts within the chest may be obstructed by the ribs, when seen in their true perspective. It is therefore advisable to study each one of a pair of stereoscopic films separately in addition to stereoscopically.

Special methods should be used in radiographing special parts of the lungs such as the apices. Rotation of the tube appears valueless.

Leo G. Rigler, M.D.

ROENTGEN STUDY OF FIVE HUNDRED CHILDREN FOR THYMIC ENLARGEMENT: Perkins (Am. Jour. Roent., vol. 15, p. 216, Mar., 1926). The danger of sudden death during minor operations, such as tonsillectomy, due to enlarged thymus, has not been sufficiently emphasized. Many cases of thymic enlargement exist without clinical symptoms. All children before operative procedure should be studied both clinically and roentgenologically for enlarged thymus. Congenital anomaly of the heart and enlarged thymus can be distinguished by roentgen examination, although the symptoms often simulate each other. Occasionally, however, an enlarged thymic gland may be placed so low that its shadow cannot be distinguished from that of the heart, thus rendering the roentgen diagnosis faulty.

Roentgen radiation presents a satisfactory method of treatment for enlarged thymus.

Leo G. Rigler, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS

E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

AN ATTEMPT AT THE DIFFERENTIAL DIAGNOSIS OF LATERAL SINUS INFECTION: George L. Tobey, Jr. (Boston Med. and Surg. Journal, January 14, 1926). There are no authentic cases on record of lateral sinus thrombosis in the absence of ear involvement, unless there is a skull fracture or a meningitis.

The great majority of cases of acute mastoiditis, properly operated and managed, lead to uneventful recovery. If there is evidence of complication, we must consider the following: Accidental folding of the auricle; a very tight bandage; marked local reaction in the wound; furunculosis of the canal; iodoform dermatitis; erysipelas; acute cervical adenitis; involvement of the other ear; acute heart, lung, intestinal, or kidney conditions, especially pyelitis in children.

In the absence of the above, intracranial complications must be considered: brain abscess, meningitis, or a sinus infection, of which we here consider only the last. A textbook case is rarely found; a diagnosis must be made upon the findings in the individual case. The more important of these findings are usually present, in most cases, but they may vary so in degree as to obscure the diagnosis. Thus, in the acute septic type the temperature may suddenly rise to 105° or 106°, and as suddenly fall to subnormal, with chills, sweating, evidences of meningeal irritation, high leucocytosis and possibly bacteremia. Again, an easily overlooked case is that which shows an irregular temperature, yet rising no more than a degree or two above normal, and with no signs of sepsis and a low leucocytosis. There

are a dull headache, insomnia, a feeling of fulness and heaviness on the affected side, loss of appetite, lassitude and malaise, with or without bacteremia. Another type shows a temperature which rises and falls from 100° as a basis, otherwise resembling the above. Still another type is entirely afebrile, being of long standing and discovered only at operation, associated with perisinus abscess.

Interference with the venous drainage from the cranial cavity by compression of the internal jugulars causes increased intracranial pressure, with a quick rise in spinal fluid pressure which may be measured by a manometer when lumbar puncture is done. When such a rise does not appear, we diagnose a subarachnoid block, due to a tumor of the spinal cord or of the cerebellar fossa, which obstructs the spinal fluid circulation.

In sinus work the mechanism is a little different, for instead of an increased column of fluid which cannot be transmitted because of obstruction, we have a venous obliteration which prevents an increase of pressure on the affected side high up at the source.

Lumbar puncture is done with the patient in the lateral position, the spinal fluid flowing into a glass manometer of 2 mm. caliber. We note the pressure reading (normally about 150 mm.), and the pulse and respiratory oscillations. Then, without disturbing the patient, an assistant makes gentle pressure on one side of the neck between the larynx and the sternomastoid muscle, until a strong carotid pulsation is felt. The rapidity and degree of rise of the fluid column is noted, as also the quickness of the drop on release of compression. The process is repeated for the opposite jugular, and then both are compressed at once.

This procedure on the normal side causes a quick rise to twice or three times the original reading; while on the completely thrombosed side there is either no rise at all, or a slow rise of from 10 to 20 mm. in the manometer. Partial obstruction from a mural thrombus gives less striking, yet valuable, results.

For accuracy in technic we must beware of (1) incomplete compression of the jugular due to obesity or local swellings; (2) a spinal fluid of normally low tension (which may easily be brought up by injecting 10 to 20 c.c. of normal saline); (3) movements of the patient; (4) normal difference on the two sides: (a) a difference of more than 50 mm. unusual and 100 mm. rare; (b) the rise in pressure seems at times slightly less when the dependent vein is compressed; (5) possible anatomic variation in the size of the lateral sinuses, the jugular veins and their tributaries.

Of two possible dangers, sudden death from subtentorial abscess or tumor may be avoided by a previous fundus and neurologic examination. The other menace is that of acute meningitis, by escape of bacteria from a localized infection or the blood stream into the spinal fluid. These experimental possibilities have not so far become clinically manifest, and can probably be prevented by not withdrawing large amounts of fluid and by not congesting the cerebral vessels, through compression, too long at a time.

VIRGIL J. SCHWARTZ, M.D.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

HANDBOOK OF DISEASES OF THE RECTUM. Louis J. Hirschman, M.D., F.A.C.S., Ex-Chairman, Section on Gastroenterology and proctology, American Medical Association. Illus. 5 color plates. 4th edition, revised and rewritten. Cloth, $6.50. St. Louis: C. V. Mosby Company, 1926.

MODERN METHODS OF AMPUTATION. Thomas G. Orr, A.B., M.D., F.A.C.S., Prof. of Surgery, University of Kansas. Illus. Cloth, $3.50. St. Louis: C. V. Mosby Company, 1926.

FACTS ON THE HEART. Richard C. Cabot, M.D., Professor of Medicine and Social Ethics, Harvard University. 781 pages. Illus. Cloth, $7.50. Philadelphia and London: W. B. Saunders Company, 1926.

YOUNG'S PRACTICE OF UROLOGY. Based on a study of 12,500 cases. Hugh H. Young, M.D., and David M. Davis, M.D., Johns Hopkins University. With the collaboration of Franklin P. Johnson. Two volumes totaling 1,484 pages with 1,003 illustrations, 20 being color plates, by William P. Didusch. Cloth, $25. Philadelphia and London: W. B. Saunders Company, 1926.

MODERN MEDICINE. Diseases of Metabolism. Diseases of the digestive system. Sir William Osler, M.D., and Thomas McCrae, M.D. 3rd edition, revised, Volume III. 1,052 pages. Illus. Cloth, $9. Philadelphia: Lea & Febiger, 1926.

COLLECTED PAPERS BY THE STAFF OF THE HENRY FORD HOSPITAL. First series 1915-1925. 665 pages. Illus. Cloth, $8. New York: Paul B. Hoeber, 1926.

DIATHERMY WITH SPECIAL REFERENCE TO PNEUMONIA. Harry Eaton Stewart, M.D. 248 pages. Illus. 2nd edition, revised and enlarged. Cloth, $3. New York: Paul B. Hoeber, 1926.

BLOOD CHEMISTRY COLORIMETRIC METHODS FOR THE GENERAL PRACTITIONER. Willard J. Stone, M.D. 2nd edition. 142 pages. Illus. Cloth (special waterproof), $3.25. New York: Paul B. Hoeber, 1926.

THE INTERNATIONAL MEDICAL ANNUAL. A Year Book of Treatment and Practitioner's Index. Forty-third year. Pp. 548; 43 plates and 87 illustrations. New York: William Wood & Co., 1925.

This book in short articles on all subjects of medicine and surgery including the specialties, gives the most recent conception of the subjects with the advance made during the last few years. It also gives the diagnosis, prognosis and treatment of all conditions mentioned with especial attention to the new methods and discoveries. The articles are arranged alphabetically and there is a comprehensive index. The print is rather small, but clear and easily read. It is a very valuable reference book for any physician, but especially for the busy practitioner. WM. W. MOIR, M.D.

OLD AND NEW VIEWPOINTS IN PSYCHOLOGY. Knight Dunlap, Prof. of Experimental Psychology, Johns

Hopkins University, Baltimore, etc. 166 pages. Cloth, $1.50. St. Louis: C. V. Mosby Co., 1925.

This volume consists of five chapters, dealing respectively with Mental Measurements, Present Day Schools of Psychology, Psychological Factors in Spiritualism, The Psychology of the Comic, and the Reading of Character from External Signs. The author calls attention to the fact that there is a great deal of application of the Binet-Simon tests by persons extremely incompetent. He stresses the fact that sufficient training is required to fit one to successfully apply and interpret these tests. He believes that the promotion of research in the field of mental measurements is a vital need. He discourages the statistical evaluation of routine tests. In his other chapters he enters into a discussion of complexes, dreams, the sense of humor and touches on Freudianism. He takes up the causes of popular belief in Spiritualism and devotes some space to a discussion of the honesty and sincerity of mediums and to the qualifications of those who investigate them. The book embodies the author's ideas as portrayed in lectures delivered by him and on criticisms of two of his colleagues in the Department of Psychology of Johns Hopkins University. It will appeal to those who are interested in this particular branch of medicine.

W. H. Hengstler, M.D.

THE PRACTICAL MEDICINE SERIES. Gynecology and Obstetrics. Vol. V. Edited by Thomas J. Watkins, M.D., F.A.C.S., and Joseph B. De Lee, A.M., M.D., in collaboration with J. P. Greenhill, B.S., M.D. 534 pages. Illus. Cloth, $2. Chicago: The Year Book Publishers, 1925.

The Gynecological section of 230 pages is edited by Thomas J. Watkins; the Obstetrical section, slightly larger, by De Lee, with the collaboration of J. P. Greenhill.

The book includes an illuminating and usable series of abstracts from the literature up to and including most of 1924. Editorial comment is often clarifying, and occasionally assists the reader in his selection of method and treatment from an assortment described.

The following gynecological subjects are developed at some length: the ovary, its physiological and anatomical pathology; the uterus, its displacements and their surgical correction, including plastic surgery of the pelvic outlet; pelvic infections, including gonorrheal infections and the cautery treatment of endocervicitis; tumors, with a considerable discussion of surgery; *x*-ray, and particularly radium, in the treatment of fibroids and carcinoma; there are a number of helpful discussions of sterility which are continued into the sections on obstetrics.

The non-interfering policy in the treatment of abortion is stressed. The editors regard tuberculosis as a dangerous complication of pregnancy, with early induction of abortion as the rational treatment.

The figures of Belding and Hunter in a study of clinical syphilis and fetal deaths indicated that syphilis causes 27 per cent of all previous fetal deaths in Wassermann-plus women, and of 64 per cent in clinical syphilis. Their figures in all hospital fetal deaths indicate that 41 per cent in Wassermann-plus women and 82 per cent in clinically syphilitic women are due to syphilis.

The toxemias are given a generous space; the editor regrets that the blood chemistry in toxemias cannot be used in prognosis or as a guide to treatment. "Eclampsia," says the editor, "is not a fully preventable disease, though a very great deal can be done in this direction." Harris' paper on the after-effects of the late toxemias is given at length. "The absence of signs of nephritis," he says, "three weeks after delivery do not preclude the possibility of permanent renal damage." De Lee's scheme for designating the degree of engagement is given. The editor admits only one indication, abruptio placentæ, for the use of pituitrin.

Obstetrical analgesia and anesthesia of some seven varieties are discussed.

"Forceps," says the editor, "are used too often by men who do not know how to apply them, and not often enough by those who do." The Kielland and other forceps are discussed. There is a long discussion of caesarian section with emphasis upon the advantages of the low, or cervical type.

There is a lengthy discussion of placenta previa and abruptio placentæ, including detailed treatment procedure.

Varied types of sepsis, their cause and treatment, are discussed.

Glandular disturbances, hemorrhages, deformities, and anomalies in the newborn are covered in the closing pages.

E. C. Hartley, M.D.

PHARMACOPEIA OF THE UNITED STATES. Tenth Decennial Revision. By the authority of the United States Pharmacopeial Convention. Prepared by the Committee of Revision and Published by the Board of Trustees. Official from January 1, 1926. Philadelphia: J. B. Lippincott Company.

There is contained an interesting history of the organization and continued arrangement of the pharmacopeia. Early in this edition one finds a section which details the variations of this volume over the preceding edition. A numerous and extensive listing of the various drugs which are used in the treatment of diseases throughout the United States is given. The discussion on each drug contains its description and physical properties, tests for its identity, purity, assay, methods of preservation and average dose. In some instances, the more common preparations are included. Formulas for certain preparations are given, as extracts, infusions, liquors, tinctures, unguents, smallpox vaccine, etc. At the end of the book there is a brief yet inclusive exposition on general tests, processes, and apparatus commonly used in pharmaceutical and chemical projects.

The value of the United States Pharmacopeia is little realized. Probably its most noteworthy achievement has been its stabilizing of the drugs and foodstuffs throughout this portion of the world, and probably also an influence of similar nature over the entire world.

Daniel H. Bessesen, M.D.

PYGMALION, OR THE DOCTOR OF THE FUTURE. R. M. Wilson, M.B., Ch.B. 68 pages. Cloth, $1. New York: E. P. Dutton & Co., 1926.

Everyone is familiar with the Greek story of the master

sculptor who created such a lovely vision that the gods granted her life. In this book, the author has compared the practice of medicine to this statue in the making, feeling that medicine has been practiced upon a physical basis and believing that the future of medicine must be endowed with the study of the mentality and spirit of patient; that is, the practice of medicine must be endowed with life and must take for its sphere the study of life.

Plato, in one of his earliest dialogues, "Charmides," states "that as you ought not to attempt to cure the eyes without the head, or the head without the eyes, so neither ought you to attempt to cure the body without the soul—and this is the reason why the cure of many diseases is unknown to the physicians of Hellas."

Pygmalion is an excellent book and explains how it has been possible for various cults to realize success of a practical sort, and also in a way portrays how future medical practice will be able to adapt itself in more thorough and complete fashion to the study of the mental and spiritual side of the patient as well as to the physical. It would be a nice volume to have in every doctor's waiting room.

DANIEL H. BESSESEN, M.D.

EARS AND THE MAN: STUDIES IN SOCIAL WORK FOR THE DEAFENED. Annetta W. Peck, Estelle E. Samuelson and Ann Lehmann, New York League for the Hard of Hearing. Introduction by Wendell C. Phillips, M.D. 217 pages. Cloth, $2. Philadelphia: F. A. Davis Company, 1926.

This very interesting book, written by three women who are not physicians, is particularly interesting to the otologist. It shows that the duty of the otologist does not end with the verdict of permanent deafness, or with such treatment as may be administered along the lines of prevention and cure.

Deafness is considered in its relation to the mind, the eyes, the job, play and education.

An interesting chapter relates to the experiences with the various aids to hearing. It discusses the equipment which should be in every auditorium, church, etc.

The social service work is greatly emphasized and justly so. Finally it deals with methods of education and publicity for the benefit of the deafened. The subject is considered from the standpoint which is most frequently neglected by the busy otologist, but nevertheless a most important one to the patient.

K. C. WOLD, M.D.